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8 **Draft Historic and Archaeological Technical**
9 **Report**
10 **Honolulu High-Capacity Transit Corridor**
11 **Project**
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17 **September 1, 2006**
18

19 Prepared for:
20 City and County of Honolulu
21 and
22 Federal Transit Administration
23

24
25 Prepared by:
26 Mason Architects Inc.
27 and
28 Cultural Surveys Hawai'i, Inc.

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2 **Draft Historic and Archaeological Technical**

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7 **Part I. Historic Resources Technical Report**

8 **Honolulu High-Capacity Transit Corridor**

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Acronyms Used in this Document

AA	Alternatives Analysis
ACHP	Advisory Council on Historic Preservation
APE	Area of Potential Effect
BPNAS	Barbers Point Naval Air Station
BRT	Bus Rapid Transit
CFR	Code of Federal Regulations
DBEDT	Department of Business Economic Development and Tourism
DP	Development Plan
DTS	Department of Transportation Services
EISPN	Environmental Impact Statement Preparation Notice
FTA	Federal Transit Administration
GIS	Geographic Information Systems
HABS	Historic American Buildings Survey
HAER	Historic American Engineering Record
HART	Honolulu Area Rail Rapid Transit
HHF	Historic Hawai'i Foundation
HOV	High Occupancy Vehicle
HR	Hawai'i Register of Historic Places
LPA	Locally Preferred Alternative
MOA	Memorandum of Agreement
MSHD	Merchant Street Historic District
NEPA	National Environmental Policy Act
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NR/NRHP	National Register of Historic Places
OMPO	O'ahu Metropolitan Planning Organization
ORTP	O'ahu Regional Transportation Plan
OTS	O'ahu Transportation Study
PB	Parsons Brinckerhoff Quade & Douglas, Inc.
PH NHL	Pearl Harbor National Historic Landmark
PMOA	Programmatic Memorandum of Agreement
SHPD	State Historic Preservation Division
SHPO	State Historic Preservation Officer
TMK	Tax Map Key
TSM	Transportation System Management
UH	University of Hawai'i
UMTA	Urban Mass Transit Administration
USDOT	United States Department of Transportation

The City and County of Honolulu Department of Transportation Services (DTS), in coordination with the U.S. Department of Transportation Federal Transit Administration (FTA), is preparing an Alternatives Analysis (AA) to evaluate alternatives that would provide high-capacity transit service between Kapolei and the University of Hawai‘i at Mānoa.

Because of federal participation in the Honolulu High-Capacity Transit Corridor Project, this project must comply with Section 106 of the National Historic Preservation Act of 1966 (NHPA) and Section 4(f) of the Department of Transportation Act of 1966. The analysis completed in this technical report to support the AA addresses the first steps in meeting the requirements of these two acts. To evaluate the relative impacts and benefits of each alternative, this report identifies potential resources and impacts, but does not include consultation and confirmation of resource eligibility. Completion of remaining requirements of these acts will occur after selection of the Locally Preferred Alternative (LPA). Table S-1 summarizes the impacts and mitigation for the different alternatives.

Chapter 5 discusses the impacts of each alternative and also includes a table (Table 5-1) that ranks the alignments within each of the five sections of the Fixed Guideway Alternative according to relative degree of impact. The rankings are based on the number of historic or potentially historic resources identified along each alignment, as well as several other weighting factors such as location of system (above-grade, at-grade, below-grade), numbers of National and/or Hawai‘i Register resources along each alignment, and whether (and how) historic districts would be affected.

Chapter 6 includes specific measures that could be implemented to mitigate some of the impacts of the proposed project.

Table S-1. Summary of Historic Resources Impacts and Mitigation

Alternative	Impacts	Mitigation
Alternative 1: No Build		
No Build Alternative	To be determined separately for each of the individual projects programmed in the 2030 O'ahu Regional Transportation Plan	To be determined separately for each of the individual projects programmed in the 2030 O'ahu Regional Transportation Plan
Alternative 2: TSM		
TSM Alternative	<ul style="list-style-type: none"> • Potential loss of integrity of setting, feeling, and association to resources considered potentially eligible for NR • Potential alteration to historic resources 	<ul style="list-style-type: none"> • "Avoid": Select areas without historic resources for improvements • "Minimize": Protect historic resources during construction • "Mitigate": Document affected historic resources prior to construction
Alternative 3: Managed Lane (by section)		
3a. Two-Direction Option		
Waiawa IC to Hālawā Stream	<ul style="list-style-type: none"> • Potential loss of integrity of setting, feeling, and association to resources considered potentially eligible for NR • Potential alteration to historic resources 	<ul style="list-style-type: none"> • "Minimize": Protect historic resources during construction • "Mitigate": Document affected historic resources prior to construction
Hālawā Stream to Pacific Street	As above	As above
3b. Reversible Option		
Waiawa IC to Hālawā Stream	As above	As above
Hālawā Stream to Pacific Street	As above	As above
Alternative 4: Fixed Guideway (by section)		
I. Kapolei to Fort Weaver Road		
Kamokila Boulevard/ Farrington Highway	<ul style="list-style-type: none"> • Potential loss of integrity of setting, feeling, and association to resources eligible or potentially eligible for NR and/or HR. • Potential alteration to historic resources 	<ul style="list-style-type: none"> • "Minimize": Choose an alignment with the fewest historic resources • "Minimize": Protect historic resources during construction • "Mitigate": Document affected historic resources prior to construction
Kapolei Parkway/ North-South Road	As above	As above
Saratoga Avenue/ North-South Road	As above	As above
Geiger Road/ Fort Weaver Road	As above	As above
II. Fort Weaver Road to Aloha Stadium		
Farrington Highway/ Kamehameha Highway	As above.	As above.

Alternative	Impacts	Mitigation
III. Aloha Stadium to Middle Street		
Salt Lake Boulevard	As above	As above
Mauka of the Airport Viaduct	As above	As above
Makai of the Airport Viaduct	As above	As above
Aolele Street	As above	As above
IV. Middle Street to Iwilei		
North King Street	<ul style="list-style-type: none"> • Potential loss of integrity of setting, feeling, and association to resources eligible or potentially eligible for NR and/or HR • Potential alteration to historic resources • Removal of two historic resources 	As above
Dillingham Boulevard	<ul style="list-style-type: none"> • Potential loss of integrity of setting, feeling, and association to resources eligible or potentially eligible for NR and/or HR • Potential alteration to historic resources 	As above
V. Iwilei to UH Mānoa		
Beretania Street/ South King Street	<p>As above, plus:</p> <ul style="list-style-type: none"> • The Beretania Street tunneling would largely reduce the impact to historic resources there (as it is assumed that careful engineering of the tunneling would take place, which would significantly minimize physical damage during construction) 	<ul style="list-style-type: none"> • “Minimize”: Choose an alignment with the fewest historic resources • “Minimize”: Protect historic resources during construction • “Minimize: Tunnel through all of Downtown Honolulu • “Mitigate”: Document affected historic resources prior to construction
Hotel Street/ Kawaiaha’o Street/ Kapi’olani Boulevard	<ul style="list-style-type: none"> • Potential loss of integrity of setting, feeling, and association to resources eligible or potentially eligible for NR and/or HR • Potential alteration to historic resources • The proposed tunneling through the Hawai’i Capitol Historic District would largely reduce the impact to historic resources there (as it is assumed that careful engineering of the tunneling would take place, which would significantly minimize physical damage during construction) 	As above
Hotel Street/ Waimanu Street/ Kapi’olani Boulevard	As above	As above
Nimitz Highway/ Queen Street / Kapi’olani Boulevard	<ul style="list-style-type: none"> • Potential loss of integrity of setting, feeling, and association to resources eligible or potentially eligible for NR and/or HR • Potential alteration to historic resources 	As above
Nimitz Highway/ Halekauwila Street/ Kapi’olani Boulevard	As above	As above
Waikīkī Spur	As above	As above

The City and County of Honolulu Department of Transportation Services (DTS), in coordination with the U.S. Department of Transportation Federal Transit Administration (FTA), will be preparing an Alternatives Analysis (AA) and an Environmental Impact Statement (EIS) to evaluate alternatives that would provide high-capacity transit service on O‘ahu. The primary project study area is the travel corridor between Kapolei and the University of Hawai‘i at Mānoa (Figure 1-1). This corridor includes the majority of housing and employment on O‘ahu. The east-west length of the corridor is approximately 23 miles. The north-south width of the corridor is at most four miles, as much of the corridor is bounded by the Ko‘olau and Wai‘anae Mountain Ranges to the north and the Pacific Ocean to the south.

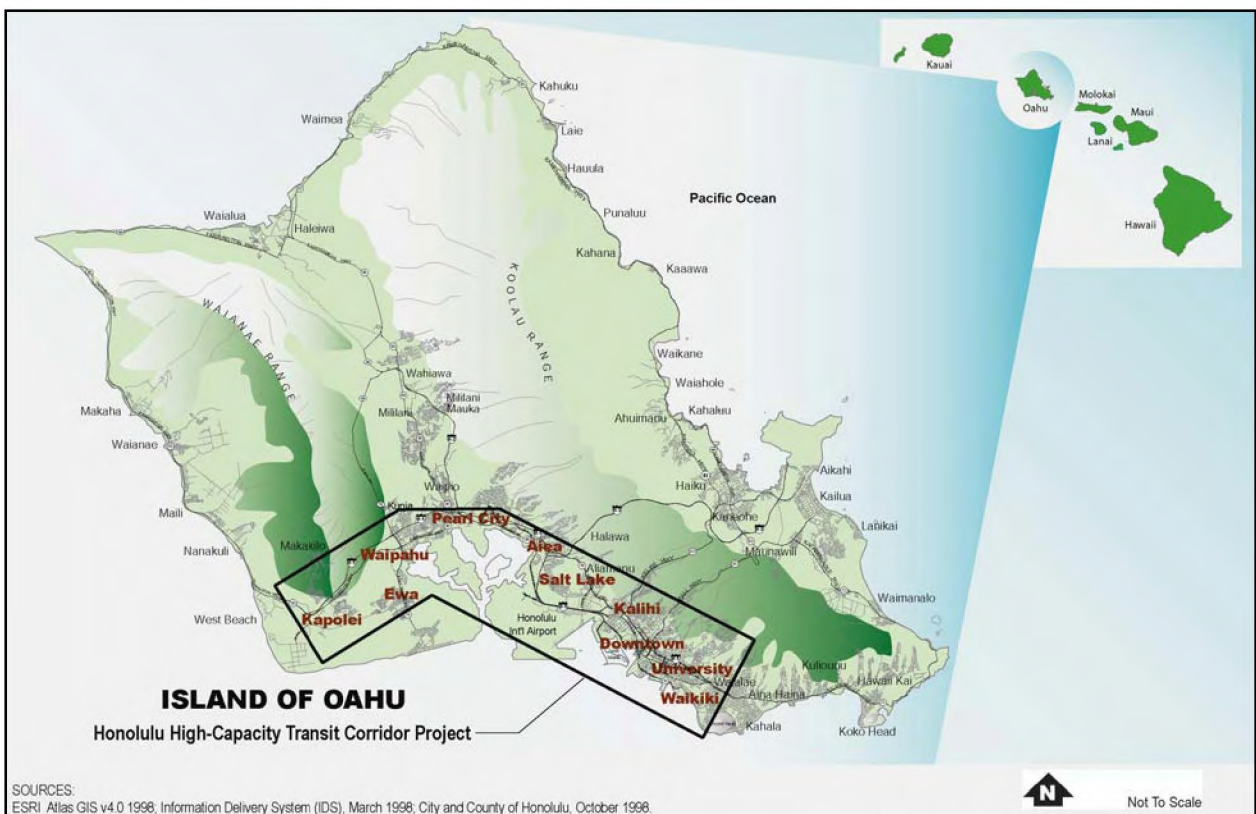


Figure 1-1. Project Vicinity

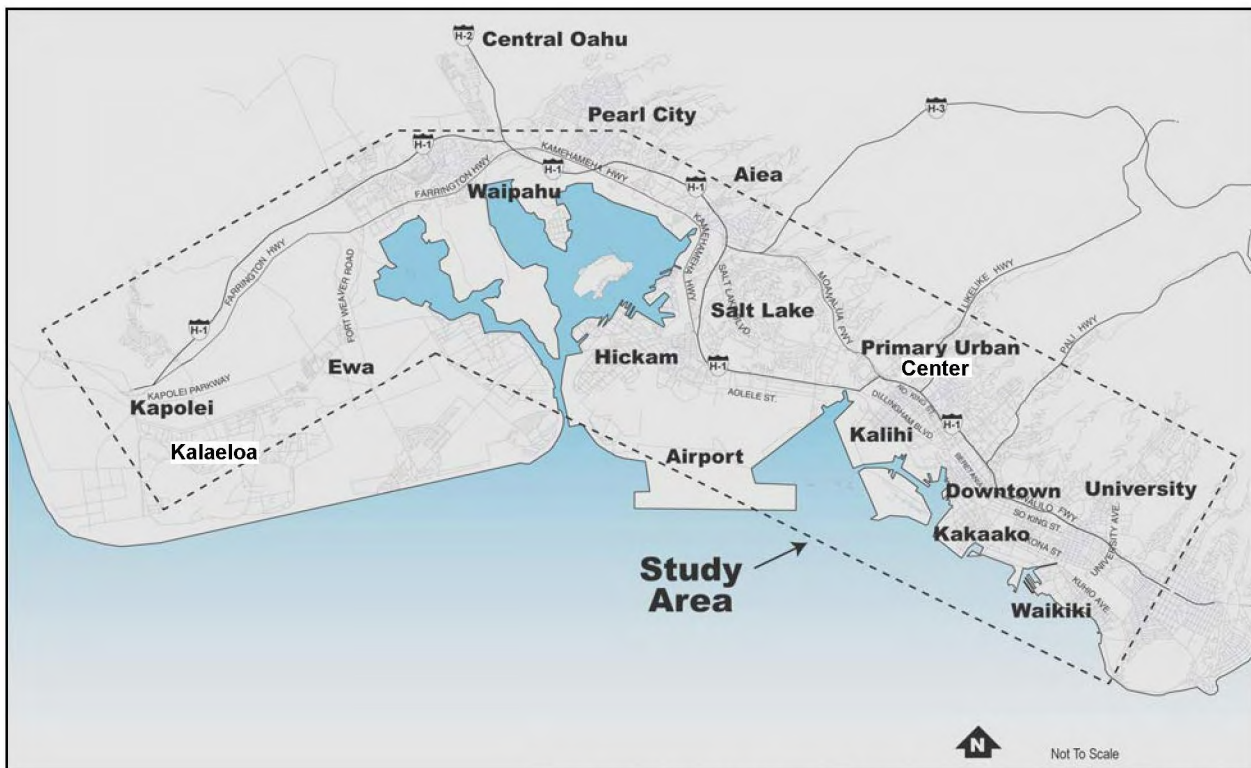
Project Description

Description of the Study Corridor

The study corridor extends from Kapolei in the west (Wai‘anae or ‘Ewa direction) to the University of Hawai‘i at Mānoa in the east (Koko Head direction), and is confined by the Wai‘anae and Ko‘olau mountain ranges to the north (mauka direction) and the ocean to the south (makai direction).

1 The corridor is constrained geographically to a narrow band between the mountains and
2 ocean. In the Pearl City, Waimalu, and 'Aiea area, the corridor's width is less than one
3 mile between the Pacific Ocean and the base of the Ko'olau Mountains.

4 The General Plan for the City and County of Honolulu directs future population and
5 employment growth to the 'Ewa, Central O'ahu, and Primary Urban Center development
6 plan areas, with the highest rate of growth in the 'Ewa area. The largest increases in
7 population and employment are projected in the 'Ewa, Waipahu, Downtown, and
8 Kaka'ako districts, which are all located in the corridor (Figure 1-2).



9 **Figure 1-2. Areas and Districts in the Study Corridor**

10 Kapolei is the center of the 'Ewa development area. It is located in a plain of former
11 sugar cane fields and is rapidly developing. To date, residential development has
12 outpaced commercial development, placing additional commuter pressure on the
13 constrained roadway system serving the area. Kapolei has been designated O'ahu's
14 "second city," and City and State government offices have opened there. The Kalaeloa
15 Community Development District (formerly known as Barbers Point Naval Air Station)
16 consists of several hundred acres adjacent to Kapolei. Several alternatives exist for the
17 redevelopment of this area, including the possibility of developing some of the area for
18 the onshore support of an aircraft carrier with a homeport at Pearl Harbor. The
19 University of Hawai'i is developing a master plan for a new West O'ahu campus in
20 Kapolei. The Department of Hawai'ian Homelands is also a major landowner in the area,
21

1 and has plans for shopping center development. Also, developers have several proposals
2 to continue the construction of residential subdivisions.

3 Continuing Koko Head, the corridor follows Farrington and Kamehameha Highways
4 through a mixture of low-density commercial and residential development. This part of
5 the corridor passes through the makai portion of the Central O‘ahu Development Plan
6 area, which lies at the bottom of the valley between the Wai‘anae and Ko‘olau Mountain
7 Ranges. Farrington Highway and the H-1 Freeway are the principal ‘Ewa-Koko Head
8 routes through this part of the corridor.

9 Moving further Koko Head, the corridor enters the Primary Urban Center Development
10 Plan area. Commercial and residential densities begin to increase in the vicinity of Aloha
11 Stadium. H-1 Freeway, Kamehameha Highway, Salt Lake Boulevard and Moanalua
12 Freeway are the principal ‘Ewa-Koko Head roadways in the western portion of the
13 Primary Urban Center development plan area. The Pearl Harbor Naval Reserve, Hickam
14 Air Force Base, and the Honolulu International Airport border the corridor on the makai
15 side. Military and civilian housing are the dominant land uses mauka of the H-1
16 Freeway, with a concentration of high-density housing along Salt Lake Boulevard.

17 As the corridor continues Koko Head across Moanalua Stream, the land use continues to
18 urbanize with increasing density. There are four principal transportation links through
19 this portion of the corridor: Nimitz Highway, Dillingham Boulevard, North King Street,
20 and the H-1 Freeway. Industrial and port land uses dominate along the harbor, shifting to
21 primarily commercial uses along Dillingham Boulevard, changing to a mixture of
22 residential and commercial uses along North King Street, with primarily residential use
23 mauka of the H-1 Freeway.

24 Koko Head of Nu‘uanu Stream, the corridor continues through Chinatown and
25 downtown. The Chinatown and downtown areas have the highest employment density in
26 the corridor. Streets in this area form an urban grid pattern, with traffic spread over
27 several arterials. The Kaka‘ako and Ala Moana neighborhoods, comprised historically of
28 low-rise industrial and commercial uses, are revitalizing with several high-rise residential
29 towers currently under construction. Ala Moana Center is both a major transit hub and
30 shopping destination.

31 The corridor continues to Waikīkī and through the McCully neighborhood to the
32 University of Hawai‘i. Today, Waikīkī is one of the densest tourist areas in the world,
33 serving approximately 72,000 visitors daily (DBEDT, 2003). The University of Hawai‘i
34 at Mānoa is the other major destination at the Koko Head end of the corridor. It has an
35 enrollment of over 20,000 students and approximately 6,000 staff (UH, 2005).
36 Approximately 60 percent of the students do not live within walking distance of the
37 campus (UH, 2002) and must travel to attend classes.

38 Currently, morning travel patterns in the corridor are heavily directional. Morning town-
39 bound traffic volumes through the Waipahu and ‘Aiea areas (Koko Head direction) are
40 more than twice the volume in the ‘Ewa direction. Afternoon flows are less directional

with 'Ewa bound traffic volumes about 50 percent greater than town-bound (Koko Head bound) traffic.

Alternatives under Consideration

Four alternatives will be evaluated in the Alternatives Analysis (AA) report. They were developed through a screening process that considered alternatives identified through previous transit studies, a field review of the study corridor, an analysis of current housing and employment data for the corridor, a literature review of technology modes, work completed by the O'ahu Metropolitan Planning Organization (OMPO) for its Draft 2030 Regional Transportation Plan, and public and agency comments received during a formal project scoping process held in accordance with requirements of the National Environmental Policy Act (NEPA) and the Hawai'i EIS Law (Chapter 343). The four alternatives are described in detail in the *Honolulu High-Capacity Transit Corridor Project Alternatives Analysis Definition of Alternatives Report (DTS, 2006a)*. The alternatives identified for evaluation in the AA report are:

- No-Build Alternative
- Transportation System Management Alternative
- Managed Lane Alternative
- Fixed Guideway Alternative

Alternative 1: No-Build Alternative

The No-Build Alternative includes existing transit and highway facilities and committed transportation projects anticipated to be operational by 2030. Committed transportation projects are those programmed in the O'ahu 2030 Regional Transportation Plan prepared by OMPO. The committed highway elements of the No-Build Alternative will also be included in the build alternatives (discussed below).

The No-Build Alternative's transit component would include an increase in fleet size to accommodate growth in population, while allowing service frequencies to remain the same as today. The specific number of buses, as well as required ancillary facilities, will be determined during the preparation of the AA.

Alternative 2: TSM Alternative

The Transportation System Management (TSM) Alternative would provide an enhanced bus system based on a hub-and-spoke route network, conversion of the present morning peak-hour-only zipper-lane to both a morning and afternoon peak-hour zipper-lane operation, and relatively low-cost capital improvements on selected roadway facilities to give priority to buses. The TSM Alternative will include the same committed highway projects as assumed for the No-Build Alternative.

Alternative 3: Managed Lane Alternative

The Managed Lane Alternative would include construction of a two-lane, grade-separated facility between Waipahu and Downtown Honolulu for use by buses, paratransit vehicles, and vanpool vehicles. High-occupancy vehicles (HOV) and toll-

1 paying, single-occupant vehicles also would be allowed to use the facility provided that
2 sufficient capacity would be available to maintain free-flow speeds for buses and the
3 above noted paratransit and vanpool vehicles. Variable pricing strategies for single-
4 occupant vehicles would be implemented to ensure free-flow speeds for high-occupancy
5 vehicles.

6 Intermediate bus access points would be provided in the vicinity of Aloha Stadium and
7 Middle Street. Bus service utilizing the managed lane facility would be restructured and
8 enhanced, providing additional service between Kapolei and other points 'Ewa of the
9 Primary Urban Center, and Downtown Honolulu and the University of Hawai'i at
10 Mānoa.

11 **Alternative 4: Fixed Guideway Alternative**

12 The Fixed Guideway Alternative would include the construction and operation of a fixed-
13 guideway transit system between Kapolei and the University of Hawai'i at Mānoa. The
14 system could use any fixed-guideway transit technology approved by FTA and meeting
15 performance requirements, and could be automated or employ drivers.

16 Station and supporting facility locations are currently being identified and would include
17 a vehicle maintenance facility and park-and-ride lots. Bus service would be reconfigured
18 to bring riders on local buses to nearby fixed-guideway transit stations.

19 Although this alternative would be designed to be within existing street or highway
20 rights-of-way as much as possible, property acquisition in various locations is expected.
21 Future extensions of the system to Central O'ahu, East Honolulu or within the corridor
22 are possible, but are not being addressed in detail at present.

23 A broad range of modal technologies were considered for application to the Fixed
24 Guideway Alternative, including light rail transit, personal rapid transit, automated
25 people mover, monorail, magnetic levitation (maglev), commuter rail, and emerging
26 technologies still in the developmental stage. Several technologies were selected in an
27 earlier screening process and will be considered as possible options for the fixed-
28 guideway technology. Technologies that were not carried forward from the screening
29 process include personal rapid transit, commuter rail, and the emerging technologies.
30 The screening process is documented in the *Honolulu High-Capacity Transit Corridor*
31 *Project Screening Report* (DTS, 2006b).

32 The study corridor for the Fixed Guideway Alternative will be evaluated in five sections
33 to simplify analysis and impact evaluation in the AA process and report. In general, each
34 alignment under consideration within each of the five sections may be combined with any
35 alignment in the adjacent sections.

36 Each alignment has distinctive characteristics, environmental impacts, and provides
37 different service options. Therefore, each alignment will be evaluated individually and
38 compared to the other alignments in each section. The sections that will be evaluated and
39 the alignments being evaluated for each section are listed in Table 1-1.

Table 1-1. Fixed Guideway Alternative Analysis Sections and Alignments

Section	Alignments Being Considered
I. Kapolei to Fort Weaver Road	Kamokila Boulevard/Farrington Highway
	Kapolei Parkway/North-South Road
	Saratoga Avenue/North-South Road
	Geiger Road/Fort Weaver Road
II. Fort Weaver Road to Aloha Stadium	Farrington Highway/Kamehameha Highway
III. Aloha Stadium to Middle Street	Salt Lake Boulevard
	Mauka of the Airport Viaduct
	Makai of the Airport Viaduct
	Aolele Street
IV. Middle Street to Iwilei	North King Street
	Dillingham Boulevard
V. Iwilei to UH Mānoa	Beretania Street/South King Street
	Hotel Street/Kawaihae Street/Kapi'olani Boulevard with or without Waikīkī Spur
	Hotel Street/Waimanu Street/Kapi'olani Boulevard with or without Waikīkī Spur
	Nimitz Highway/Queen Street/Kapi'olani Boulevard with or without Waikīkī Spur
	Nimitz Highway/Halekauwila Street/Kapi'olani Boulevard with or without Waikīkī Spur
	Waikīkī Spur

Project Purpose

The purpose of the Honolulu High-Capacity Transit Corridor Project is to provide improved mobility for persons traveling in the highly congested east-west transportation corridor between Kapolei and the University of Hawai'i at Mānoa (UH Mānoa), confined by the Wai'anae and Ko'olau Mountain Ranges to the north and the Pacific Ocean to the south. The project would provide faster, more reliable public transportation services in the corridor than those currently operating in mixed-flow traffic. The project would also provide an alternative to private automobile travel and improve linkages between Kapolei, the urban core, UH Mānoa, Waikīkī, and the urban areas in between. Implementation of the project, in conjunction with other improvements included in the O'ahu Regional Transportation Plan (ORTP), would moderate anticipated traffic congestion in the corridor. The project also supports the goals of the O'ahu General Plan and the ORTP by serving areas designated for urban growth.

Project Area Needs

Improved mobility for travelers facing increasingly severe traffic congestion.

The existing transportation infrastructure in this corridor is overburdened handling current levels of travel demand. Motorists experience substantial traffic congestion and delay at most times of the day during both the weekdays and weekends. Transit is caught in the same congestion. Travelers on O‘ahu’s roadways currently experience 42,000 daily vehicle-hours of delay, which is projected to increase over seven-fold to 326,000 daily vehicle-hours of delay by 2030. Current morning peak-period travel times for motorists from Kapolei to downtown average between 40 and 60 minutes, while recent observations of bus travel times from ‘Ewa Beach to downtown ranged from 30 to 80 minutes depending on traffic conditions. By 2030, these travel times are projected to more than double. Within the urban core, most major arterial streets will experience increasing peak period congestion, including Ala Moana Boulevard, Dillingham Boulevard, Kalākaua Avenue, Kapi‘olani Boulevard, King Street and Nimitz Highway. Expansion of the roadway system between Kapolei and UH Mānoa is constrained by physical barriers and by dense urban neighborhoods that abut many existing roadways. Given the current and increasing levels of congestion, a need exists to offer an alternative way to move within the corridor independent from current and projected highway congestion.

Improved transportation system reliability.

As roadways become more congested, they become more susceptible to substantial delays caused by incidents such as traffic accidents or heavy rain. Because of the operating conditions in the study corridor, current travel times are not reliable for either transit or automobile trips. In order to get to their destination on time, travelers have to allow extra time in their schedules to account for the uncertainty of travel time. This is inefficient and results in lost productivity. Because the bus system primarily operates in mixed-traffic, transit users experience the same level of travel time uncertainty as automobile drivers. Recent statistics from TheBus indicate that on a systemwide basis, for all classes of bus routes, 45 percent of buses were on time, 27 percent were more than five minutes late and 28 percent more than one minute early. In the morning peak period, express buses were on time 27 percent of the time, with 38 percent being late and 35 percent being early. A need exists to reduce the variability of transit travel times, and provide a system with increased predictability and reliability.

Accessibility to new development in ‘Ewa/Kapolei/Makakilo as a way of supporting policy to develop the area as a second urban center.

Consistent with the General Plan for the City and County of Honolulu, the highest population growth rates for the island are projected in the ‘Ewa Development Plan area (comprised of the ‘Ewa, Kapolei and Makakilo communities) which is expected to grow by 170 percent between years 2000 and 2030. This growth represents nearly 50 percent of the total growth projected for the entire island. Within this area, Kapolei, which is developing as a “second city” to Downtown Honolulu, is projected to grow by 426 percent, the ‘Ewa neighborhood by 123 percent and Makakilo by 94 percent between

years 2000 and 2030. Accessibility to the overall 'Ewa Development Plan area is currently severely impaired by the congested roadway network, which will only get worse in the future. This area is less likely to develop as planned unless it is accessible to downtown and other parts of O'ahu; therefore, the 'Ewa/Kapolei/ Makakilo area needs improved accessibility to support its future growth as planned.

Improved transportation equity for all travelers.

Many lower-income and minority workers live in the corridor outside of the urban core and commute to work in the Primary Urban Center Development Plan Area. Many lower-income workers also rely on transit because they are not able to afford the cost of vehicle ownership and operation. In addition, daily parking costs in Downtown Honolulu are among the highest in the United States, further limiting this population's access to the downtown. Improvements to transit capacity and reliability will serve all transportation system users, including low-income and under-represented populations.

History of Project

Transit has a long history on O'ahu starting with the O'ahu Railway and Land (OR&L) system that carried passengers on approximately 150 miles of track between 1890 and 1947. The route structure included a line in the corridor between 'Ewa and Honolulu (Chiddix and Simpson, 2004). The Honolulu Rapid Transit and Land (HRT&L) system began operating an electric streetcar system in Honolulu in 1903 and had over 20 miles of lines in operation during its peak. The population of O'ahu was 59,000 people in 1900, three years before the start of the streetcar system, and had increased to 120,000 by 1920.

Roadway development, buses, and private automobile ownership resulted in decreasing rail-transit demand beginning in the 1920's. Buses were less expensive to operate than rail-transit. They operated on city streets that were developed and maintained with taxpayer funds, rather than railways that had to be privately developed and maintained. The HRT&L streetcars were completely replaced by buses in 1942. Increasing transportation demand was met in the 1950's with the development of the H-1 freeway.

The population of O'ahu kept increasing, from 350,000 people in 1950 to 500,000 in 1960 and 630,000 by 1970. However, despite increasing travel demand, public opposition to extensive freeway expansion began to develop in the early 1960's. A proposal for an elevated Makai Freeway was abandoned. The island-wide O'ahu Transportation Study (OTS) that was completed in 1967 concluded that a fixed-guideway transit system, serving a corridor between Pearl City and Hawai'i Kai, would provide cost-effective transportation capacity as part of a larger transportation system expansion needed to meet increased demand (OTSPC, 1967).

During the early 1970's, the Preliminary Engineering and Evaluation Program (PEEP) I and PEEP II studies further explored options for a fixed-guideway transit system. Based on these studies, the City and County of Honolulu began planning the Honolulu Area Rail Rapid Transit (HART) project to provide transit in the corridor identified in the 1967

OTS study, Pearl City to Hawai‘i Kai. In 1982, project planning, environmental analysis, and preliminary engineering culminated in a Final Environmental Impact Statement issued by the City and the Urban Mass Transportation Administration (UMTA was the predecessor to the current Federal Transit Administration [FTA]). However, a change in city administration resulted in changed transportation priorities and work on the HART project stopped. O‘ahu’s population continued to increase (in 1980 O‘ahu’s population was 760,000).

In 1985, the City partnered with UMTA to begin a new study for an exclusive right-of-way, fixed-guideway rapid transit project. The Honolulu Rapid Transit Development Project (HRT) built on the planning completed for the HART project, but explored new automated transit technologies. When the Alternatives Analysis/draft Environmental Impact Statement (AA/DEIS) for the project was completed in 1990, the island’s population had grown to 840,000 people.

Later in 1990, following completion of the AA/DEIS, the State Legislature passed funding acts to provide State funds and authorize the City to impose a general use and excise tax surcharge to provide local funding for the project. Local funding was needed to leverage the federal funds that Congress would make available for the project. The City selected a grade-separated, fixed-guideway transit alternative that included a tunnel under downtown, and FTA authorized the City to proceed to preliminary engineering for this alternative (the locally preferred alternative, or LPA).

Over the next two years, the City conducted additional engineering studies and issued a request for proposals to construct the system. Soil conditions in the downtown area and updated financing and environmental impact information resulted in an amendment to the LPA. The project was changed to follow Nimitz Highway on an elevated structure, and a branch line to Waikīkī was eliminated. The FTA and the City issued a Supplemental EIS to address the amended LPA, and the addition of several park-and-ride lots to the project. In 1992, a final EIS was issued on the project. However, the City Council failed to authorize the general use and excise tax surcharge to provide the local funding, and the project collapsed. Federal funds allocated to Honolulu were diverted to cities on the mainland.

During this planning, and while O‘ahu’s population was steadily increasing, the number of trips taken, or “transportation demand,” was increasing at a greater rate than population growth. In 1960, 134,000 automobiles were registered on O‘ahu and residents made a total of 1,190,000 daily person trips. Eleven percent of those trips were made by transit (OTPP, 1967). In 1980, 2,170,000 daily person trips were made and eight percent of those were made by transit (OMPO, 1984). By 1990, there were 613,000 automobiles registered on O‘ahu. Residents made 2,410,000 daily person trips and only seven percent of the trips were made by transit (OMPO, 1995). Between 1960 and 1990, the population of O‘ahu increased by 68 percent, while the number of daily person trips more than doubled, and the number of vehicles registered on the island increased five-fold.

1 In 1998, the City began developing the O‘ahu Trans 2K Islandwide Mobility Concept
2 Plan. Through an intensive public involvement program, the Plan identified the
3 increasing need for improved mobility and links between land use and transportation.
4 The plan endorsed an integrated transportation approach, with roadway, high-occupancy
5 vehicle, and transit improvements. Once again the need for high-capacity, frequent
6 transit service was identified for the Primary Urban Center. This study led to the Primary
7 Corridor Transportation Project.

8 Unlike prior projects, the Primary Corridor Transportation Project focused on alternatives
9 that could be constructed within existing transportation rights-of-way to provide mobility
10 improvements at a lower cost and with fewer impacts. A Major Investment Study and
11 draft EIS was completed in 2000, which proposed a system based on bus rapid transit
12 (BRT) operations. The BRT system continued to be developed and refined into the
13 locally preferred alternative addressed in the Final EIS in 2002. The proposed system
14 included Regional and In-Town BRT operations extending from Kapolei to Waikīkī and
15 the University of Hawai‘i at Mānoa.

16 Some of the Regional and In-Town BRT facilities from the BRT system proposal have
17 been completed. The Hawai‘i Department of Transportation has implemented the
18 extension of the morning “zipper lane” between Radford Drive and Ke‘ehi Interchange.
19 In-Town BRT facilities that have been constructed include seven transit stops and the
20 reconstruction of Kūhiō Avenue between Kalākaua Avenue and Kapahulu Avenue.

21 The 2030 O‘ahu Regional Transportation Plan includes the afternoon “zipper lane” that
22 was also proposed as part of the regional BRT project. This facility will be included in
23 the No-Build Alternative and all other alternatives analyzed in this Honolulu High-
24 Capacity Transit Corridor Project. Other elements of the Primary Corridor
25 Transportation Project, such as transit centers, are part of the 2030 O‘ahu Regional
26 Transportation Plan, while others, including additional transit centers and expanded bus
27 service, will be part of the proposed TSM Alternative.

28 Between 1990 and 2000 the island again experienced travel demand growth that
29 outstripped population growth, with a five percent increase in residents and a 15 percent
30 increase in trips. The population of O‘ahu in the year 2000 was 880,000, residents made
31 2,760,000 daily person trips, and transit continued to carry seven percent of the total trips
32 (OMPO, 2001).

33 Transportation demand has continued to increase on O‘ahu since 2000. As part of its
34 work to update the regional transportation plan, OMPO surveyed O‘ahu residents about
35 transportation issues in 2004. The survey identified commute-period traffic congestion in
36 the ‘Ewa and Central O‘ahu to Downtown Honolulu corridor as the greatest concern.
37 Nearly twice as many residents responded that improving transit was more important
38 than building more roadways. Seventy percent of the respondents believed that rail rapid
39 transit should be constructed as a long-term transportation solution and 55 percent
40 supported raising taxes to provide local funding for the system.

During the summer of 2005, the State legislature recognized the need and public support for high-capacity transit on O‘ahu and passed Act 247. Act 247 authorized the County to levy a general excise tax surcharge to construct and operate a mass transit project serving O‘ahu. The City Council subsequently adopted Ordinance 05-027 to levy a tax surcharge to fund public transportation. With secure local funding established for the first time; the City began the AA process to implement a high-capacity transit system in the corridor between Kapolei and the University of Hawai‘i at Mānoa. A range of alternatives was evaluated and screened to select alternatives that would provide the most improvement to person-mobility and travel reliability in the study corridor. FTA published a Notice of Intent in the *Federal Register* on December 7, 2005, and DTS published an EIS Preparation Notice (EISPN) in the State of Hawai‘i *Environmental Notice* on December 8, 2005. The public was asked to comment on the selected alternatives, the proposed purpose and need for the project, and the range of issues to be evaluated at a series of scoping meetings held in December 2005.

Project Schedule

Projects developed through the FTA *New Starts* process progress through many stages from system planning to operation of the project. The Honolulu High-Capacity Transit Corridor Project is currently in the Alternatives Analysis phase, which includes defining and evaluating specific projects to address the purpose of and needs for the project discussed earlier in this chapter. The anticipated project development schedule is shown in Figure 1-3.

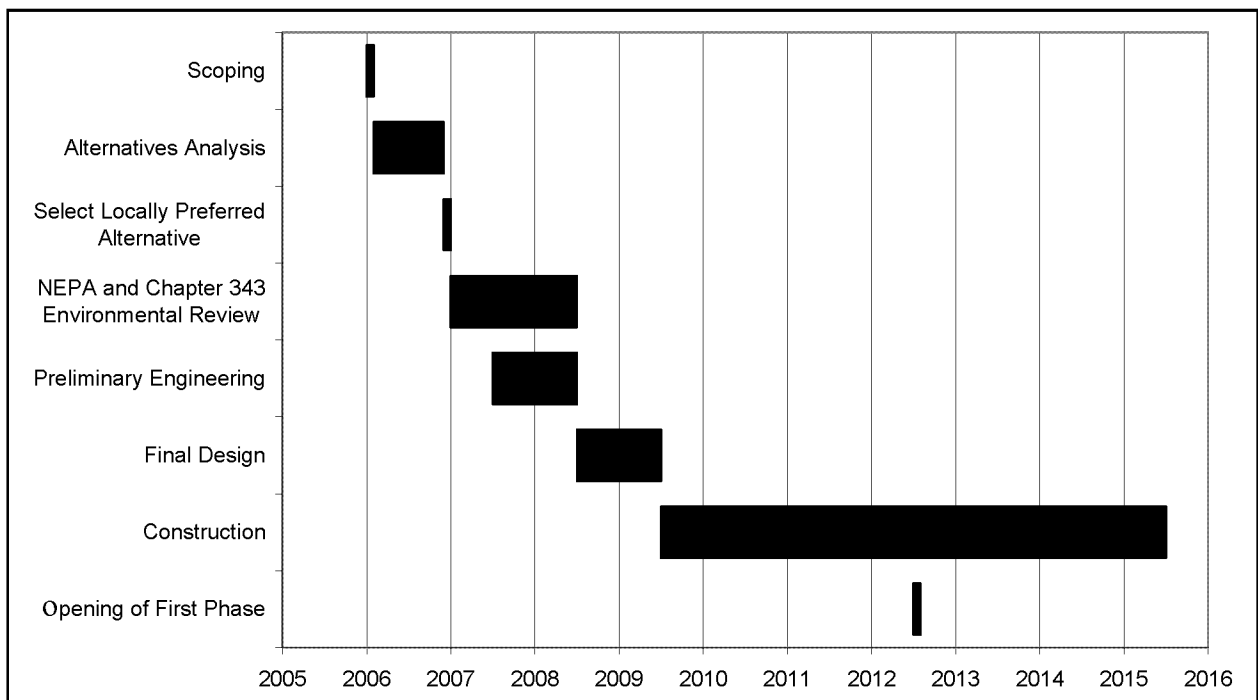


Figure 1-3. Project Schedule

Regulatory Background

Because of federal participation in the Honolulu High-Capacity Transit Corridor Project, this project must comply with Section 106 of the National Historic Preservation Act of 1966 (NHPA) and Section 4(f) of the Department of Transportation Act of 1966. The analysis completed in this technical report to support the AA addresses the first steps in meeting the requirements of these two acts. To evaluate the relative impacts and benefits of each alternative, this report identifies potential resources and impacts, but does not include consultation and confirmation of resource eligibility. Completion of remaining requirements of these acts will be completed after selection of the LPA.

Section 106

Section 106 requires “Federal agencies to take into account the effects of their undertakings on historic properties and afford the [Advisory] Council [on Historic Preservation] an opportunity to comment on such undertakings” (36 CFR Part 800.1). The section 106 process *“seeks to accommodate historic preservation concerns with the needs of Federal undertakings through consultation among the agency official and other parties with an interest in the effects of the undertakings on historic properties, commencing in the early stages of project planning. The goal of consultation is to identify historic properties potentially affected by the undertaking, assess its effects and seek ways to avoid, minimize, or mitigate any adverse effects on historic properties (36 CFR Part 800.1).”*

In accordance with Section 106, the “effect” of the project on historic resources must be determined by the federal agency proposing or regulating the project. There are three possible “effect” findings:

- No historic properties affected
- No adverse effect
- Adverse effect

“No historic properties affected” means that either there are no historic properties present or there are historic properties present but the undertaking will have no effect upon them of any kind (that is, neither harmful nor beneficial). An “effect” means alteration to the characteristics of a historic property qualifying it for inclusion in, or eligibility for, the National Register of Historic Places (NR).

“No adverse effect” means that there could be an effect, but the effect would not be harmful to those characteristics that qualify the property for inclusion in the NR. In other words, it would not diminish or adversely affect the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association.

An “adverse effect” means an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NR in a

manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association. Consideration is given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property’s eligibility for the NR. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative. If an “adverse effect” is determined, a Memorandum of Agreement (MOA) between the federal agency and the State Historic Preservation Officer (SHPO) is prepared. Other parties are allowed to be MOA signatories.

Section 4(f) of the Department of Transportation Act

Regulations developed to implement Section 4(f) of the Department of Transportation Act of 1966 (recodified and amended as 49 USC Section 303(c)) state that this Federal agency “may not approve the use of land from a significant publicly owned public park, recreation area, or wildlife and waterfowl refuge, or any significant historic site unless a determination is made that: (i) There is no feasible and prudent alternative to the use of land from the property; and (ii) The action includes all possible planning to minimize harm to the property resulting from such use” (23 CFR 771.135). Section 4(f) also states that “supporting information must demonstrate that there are unique problems or unusual factors involved in the use of alternatives that avoid these properties or that the cost, social, economic, and environmental impacts, or community disruption resulting from such alternatives reach extraordinary magnitudes” (23 CFR 771.135).

Section 4(f) requires that the U.S. Department of Transportation (USDOT) consult with the SHPO, as well as with local officials, “to identify all properties on or eligible for the National Register of Historic Places. The section 4(f) requirements apply only to sites on or eligible for the National Register unless the Administration determines that the application of section 4(f) is otherwise appropriate” (23 CFR 771.135).

The Section 106 process is integral to the 4(f) process, with respect to cultural resources. The identification of adverse affects to significant historic resources that are listed or eligible for the National Register of Historic Places under criterion A, B, and C (but not D; properties “that have yielded or may be likely to yield, information important in prehistory or history”) as part of Section 106 generally will satisfy 4(f) requirements. Each act specifies its own procedures for planning and consultation.

(In addition to historic resources, Section 4(f) also applies to public parklands. For this AA, project affects on Section 4(f) resources are being considered in the evaluation of effects to potentially historic structures and to parklands, but specific coordination and requirements established by Section 4(f) will be addressed after selection of the LPA.)

Previous Studies

Several studies of earlier Honolulu transit proposals were used as a basis for this current project and its effects on historic resources. While the earlier studies did not review all of the alignments proposed under the current project and did not use the same year-built

1 cut-off date (1965), many of the current alignments are very similar to the older ones.
2 Most of the studies reviewed the alignments that are part of the current Fixed Guideway
3 Alternative; however the *Nimitz Highway Improvement Project* focused on some of the
4 historic resources on the Nimitz Highway portion (Hālawa Stream to Pacific Street
5 section) of the Managed Lane Alternative.

6 The relevant reports are:

7 *Honolulu Area Rail Rapid Transit Project, Historic Sites Survey*, 1979. (Glenn Mason,
8 Charles R. Sutton & Assoc., Inc.).

9 *Historic Sites Inventory Report for the Honolulu Rapid Transit Development Project*,
10 August 1989. (Spencer Mason Architects).

11 *Primary Corridor Transportation Project: Product 7-12 Historic/Cultural Resources*
12 *Impacts Technical Report*. May 1999. (Mason Architects, Inc.).

13 *Nimitz Highway Improvement Project, Historic Resources Survey Phase II*, January
14 2005. (Mason Architects, Inc.).

15 **Coordination**

16 During the AA phase, meetings were held with the State Historic Preservation Division
17 (SHPD) and Historic Hawai'i Foundation (HHF) to elicit comments on the methodology
18 approach (see Chapter 3). The comments received from SHPD and HHF were be made
19 available to each party and discussed in a follow-up meeting.

Historic Resources

A review of resources along the proposed alignments was conducted as part of the AA process to determine if they are eligible for the National Register of Historic Places. The methods used for data collection, review, and evaluation of the resources along the alignments are discussed below.

To support the evaluation of each alternative to project objectives in the AA, the following measure will be tabulated in the *Historic and Archeological Resources Technical Reports*:

- Number of direct impacts to identified historic resources.

Alternatives Analysis Methodology

The AA process includes an initial-level identification of potential historic properties and districts within the study area. The study area's boundaries are determined directly by the alignments currently under consideration for both the Managed Lane and Fixed Guideway Alternatives. The study area includes all properties on both sides of each alignment (one tax map lot deep). This definition was approved by SHPD in 1999 for use on the Primary Corridor Transportation Project. Historic view planes will not be assessed during this phase of work; view planes will be assessed in the Draft Environmental Impact Statement (draft EIS) phase after an LPA has been selected by the City Council.

A preliminary list, identifying pre-1965 resources in the study area, was created using City and County of Honolulu Geographic Information Systems (GIS) data. The resources included in the list are those found in lots along the proposed alignments. The 1965 cut-off was used to identify those resources with year-built dates close to or more than 50 years old by the year 2015, which is the project's targeted completion date. The preliminary list identified approximately 1,000 pre-1965 resources along the proposed alignments.

After completion of the AA, the City Council will select the LPA.

Existing Conditions

The preliminary list was used to show which resources were reviewed in previous studies, and/or are already included in the SHPD's State and National Register Lists. All pre-1965 resources were reviewed and documented to determine the following:

- Are they on the National Register of Historic Places (NRHP)
- Are they on the Hawai'i Register of Historic Places
- Have they been officially determined eligible for the NRHP

- Have they not yet been studied and therefore require a future determination of eligibility for the NRHP (see Appendices A and B for results of the study for this report).

Identification of historic districts and resources from previous studies were incorporated into the affected environment analysis (Chapter 4), which also includes a discussion of historic districts that are within or adjacent to the alignment and study area borders.

Technical Report: Initial Field Survey

This technical report documents the above-noted historical resource data collection, information gathering, field visits, and analysis. The field survey identifies those buildings and structures that appear to possess distinctive characteristics of a type, period, or method of construction. Resources that are already on the National or Hawai‘i Register, those that appear eligible, and those that appear eligible but need further research are listed in Appendices A and B.

This technical report also generally assesses the effects to historical resources along each of the alignments and includes a discussion of typical mitigation measures. Mitigation measures *specific to the historic resources* will not be provided during the AA process but will be identified once an LPA has been selected by the City Council.

Draft EIS Phase Methodology

Once an LPA has been selected, a draft EIS will be produced, requiring adherence to Section 106 and Section 4(f). These activities have not been completed and will not be incorporated into the AA. Compliance with Section 106 will entail consultation with the State Historic Preservation Division to accomplish the following:

- Identify other parties with historic preservation focus
- Define the Area of Potential Effect (APE)
- Determine the eligibility of properties identified within the APE (according to National Register Criteria)
- Make a determination of effect
- Develop specific mitigation measures to resolve anticipated adverse effects.

The methodology to define and assess historic resources will be refined for the draft EIS phase of work as the project progresses.

Definitions

The term “historic resource” is used in this report to mean a building, structure, object, site, or district that represents a significant part of the history, architecture, archaeology, engineering, or culture of an area and also retains the integrity necessary to convey its significance. For this report, buildings, bridges (structures), stone paving and curbing (objects), and cemeteries and parks (sites) were considered for the designation of potential historic resources if they date from 1965 or earlier. The term “historic property” is used interchangeably in this report with “historic resource.” (This term,

1 along with “historic resource,” is used in the National Historic Preservation Act. It is
2 defined as: "any prehistoric or historic district, site, building, structure, or object included
3 in, or eligible for inclusion on the National Register"; such term includes artifacts,
4 records, and remains that are related to such district, site, building, structure, or object
5 (16 U.S.C. Section 470(w)).

6 In this report, the terms “pre-1965 building” and “pre-1965 resource” are used to describe
7 buildings and resources that meet the 1965 cut-off, but have yet to be evaluated as
8 potentially historic or previously determined to be historic. The term “parcel” is used to
9 refer directly to the particular plot of land where a historic resource or historic property is
10 located.

11

Chapter 4

Affected Environment

For the purposes of historic resources, the Affected Environment is the study area defined in the Methodology (Chapter 3) as “all properties on both sides of each alignment (one tax map lot deep).” Most of the study area from Kapolei to UH Mānoa, including the Managed Lane Alternative alignment along the Nimitz Highway, has been reviewed for historic resources in previous studies (see Chapter 2, Studies and Coordination). However, due to the 1965 cut-off date being used for this current study, several hundred additional properties within this area were added. City and County property records were searched to determine the number of properties in the affected environment that were field checked and evaluated. The affected environment of each of the four alternatives under consideration in this AA is discussed below.

No Build Alternative

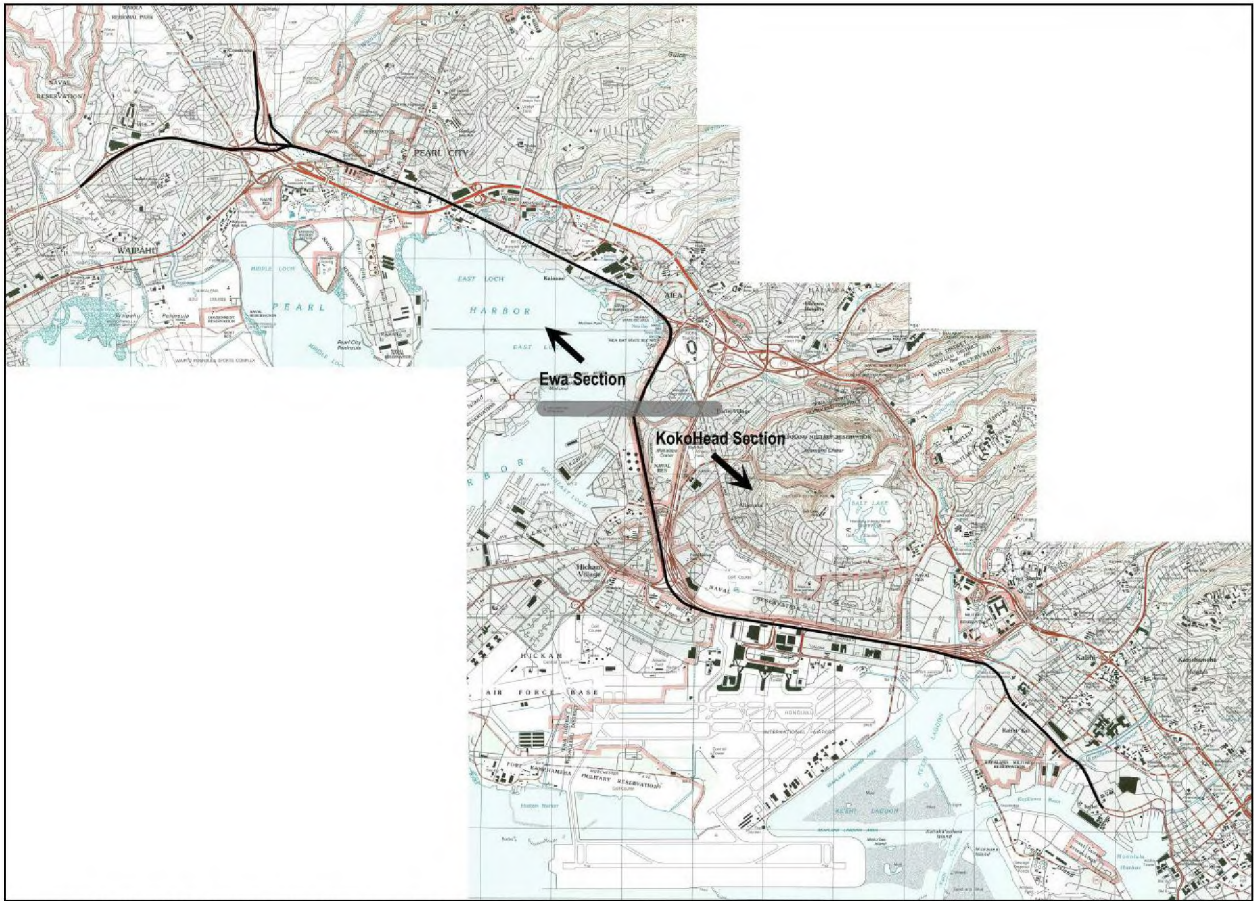
The geographic areas and, therefore, the historic resources that could be affected by this alternative are unpredictable since the required ancillary facilities and the specific number of buses have not yet been determined. The environments affected and impacts on historic resources would be discussed in individual development projects' environmental documentation submitted for permit approvals.

Transportation System Management Alternative

The details of physical improvements to roads and highways, such as widening of intersections, have not yet been developed. Many of the affected historic resources would be a subset of the historic resources studied for the Fixed Guideway Alternative. Any historic resources affected by improvements outside of those for the Fixed Guideway Alternative study area would be addressed during the next stage of planning, if the Transportation System Management Alternative is selected.

Managed Lane Alternative

The search of City and County property records initially identified 138 tax map lots along the Managed Lane Alternative alignments with pre-1965 resources. The Managed Lane Alternative largely follows the Nimitz Highway, the airport viaduct, and Kamehameha Highway, with spurs along portions of the Interstate Route H-2 and H-1 freeways to the north and west of their interchange. This alternative is divided into two sections: from Waiawa Interchange to Hālawa Stream (‘Ewa section) and from Hālawa Stream to Pacific Street (Koko Head section).



Source: USGS 7.5 Minute Series Topographic Map. Waipahu (1998), Pearl Harbor (1999) and Honolulu (1998) Quadrangles.

Figure 4-1. Managed Lane Alternative

Summary of Affected Resources (Waiawa IC to Hālawā Stream)

The Waiawa Interchange to Hālawā Stream section of the Managed Lane Alternative runs along or through Waipahu, Pearl City, ‘Aiea, and Pearl Harbor Naval Base. There are 78 properties along this section that have pre-1965 resources. City and County data indicate that most of these resources date from the 1950s and early 1960s. Because of their relatively recent dates, most of them have not been identified in previous studies as being on, or evaluated as eligible for, the National or Hawai‘i Registers, except for those within the boundaries of the Pearl Harbor National Historic Landmark. All resources were evaluated for potential NRHP eligibility as part of this project. Nine were found to be either potentially eligible, potentially eligible pending further study, or already on the NRHP (as part of the PH NHL). A discussion of these resources is included below, and they are listed with their respective status in Appendix A. (The final determination of eligibility would occur during the Section 106 consultation process, after selection of the LPA.)

One important resource in this section is the Sumida Farm, which is comprised of agricultural land and associated buildings occupying three parcels. This family-owned and operated farm is the last remaining agricultural operation in the vicinity of Pearlridge

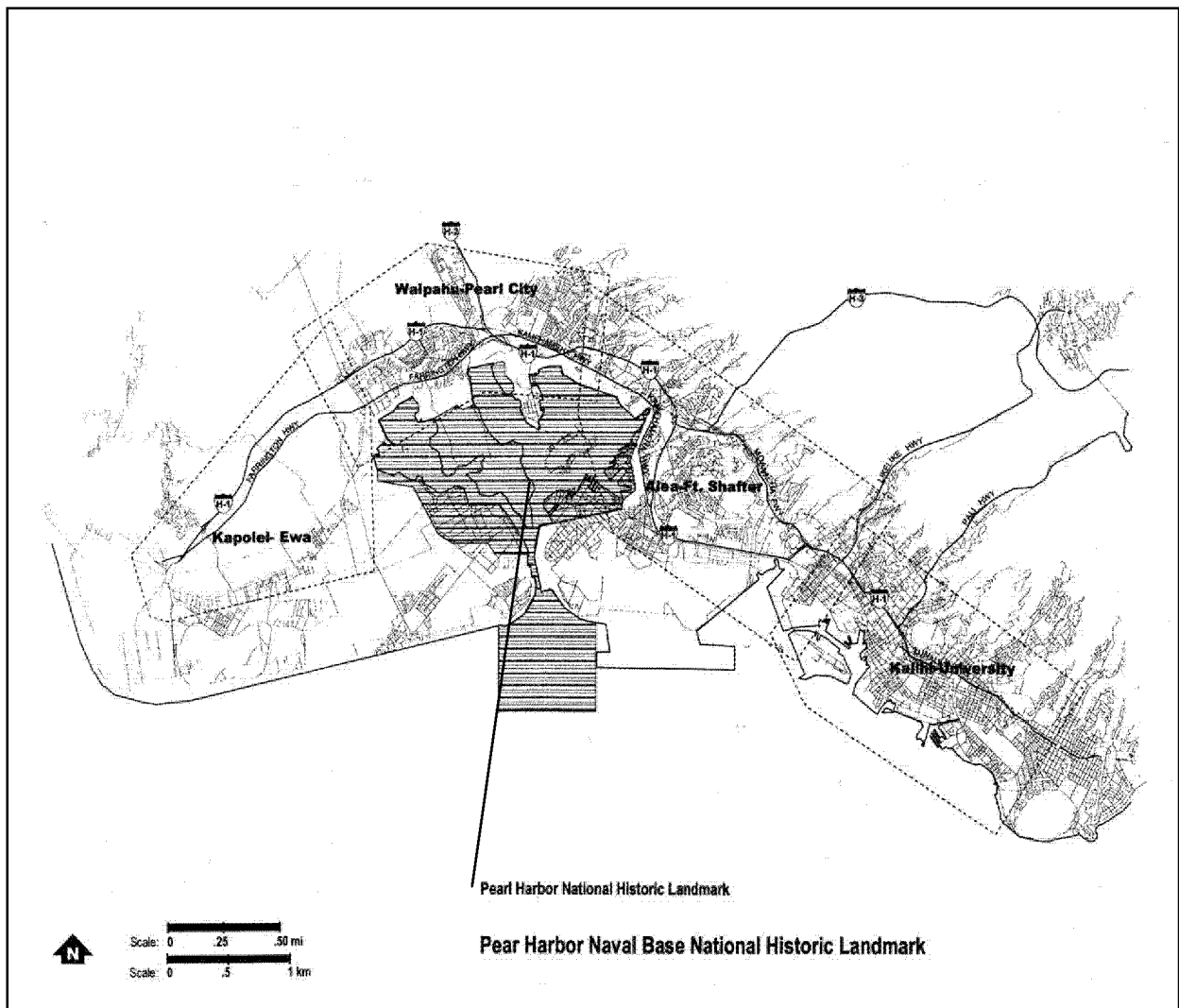
Shopping Center. This area contained numerous natural springs and was a center of diversified agriculture during the time that Sumida Farm began in 1928. This property is an oasis in a heavily congested, high-traffic commercial area. As such, its integrity of setting has already been compromised. This property qualifies as a cultural landscape, specifically a “Historic Vernacular Landscape” as defined in a National Park Service Technical Brief as,

A landscape that evolved through use by the people whose activities or occupancy shaped that landscape. Through social or cultural attitudes of an individual, family or a community, the landscape reflects the physical, biological, and cultural character of those everyday lives. Function plays a significant role in vernacular landscapes. They can be a single property such as a farm or a collection of properties such as a district of historic farms along a river valley. Examples include rural villages, industrial complexes, and agricultural landscapes (Birnbaum, 1994).

Four more historic resources along this alignment include a cemetery, a shopping center, a Hawai’ian Electric Company industrial facility, and a small restaurant. One resource, the 1945 Hālawā Stream Bridge, is at the border between two sections of Alternative 3. As such, it is included in the count of historic resources for each section.

Both sections of the Managed Lane Alternative would run alongside the Pearl Harbor National Historic Landmark’s Kamehameha Highway boundary. Pearl Harbor Naval Base was declared a National Historic Landmark (NHL) by the Secretary of the Interior in 1964 (Figure 4-2). The boundaries of the NHL were established in 1974 and certified in 1978, and include all of the water areas of the harbor, Waipū Peninsula, Ford Island, and areas to the east and west of the harbor. The overall significance of the naval base is its representation of the rise of the United States as a naval power in the Pacific in the 20th century. This long period of significance is often overlooked because of the harbor’s better-known roles in World War II and its fame as the site of the December 7, 1941 attack by the Japanese.

Three historic resources within the Landmark on Kamehameha Highway are included in both sections: a publications building, a tank farm for fuel storage, and a splinter-proof air raid shelter.



Source: Primary Corridor Transportation Project: Product 7-12, Historic/Cultural Resources Impacts Technical Report, May 1999.

Figure 4-2. Pearl Harbor National Historic Landmark

Summary of Affected Resources (Hālawā Stream to Pacific Street)

The Hālawā Stream to Pacific Street segment of this alternative runs along the existing H-1 Freeway viaduct above the airport and Māpunapuna areas; it then passes through Kalihi Kai and Iwilei. There are 63 pre-1965 resources along this section. City and County data indicate that the bulk of these date from the 1950s and early 1960s. However, a few of these properties were evaluated in a previous study (Mason Architects, 2005), and two properties were evaluated as eligible for the National Register. The remaining 61 pre-1965 resources were evaluated for NRHP eligibility as part of this project, and 19 were found to be potentially eligible, potentially eligible pending further study, or already on the NRHP. They are discussed below and their Register status is listed in Appendix A.

Two of the 19 historic resources that would be affected are the Navy housing neighborhoods of Makalapa and Little Makalapa, located along Kamehameha Highway

1 across from Pearl Harbor Naval Base. As mentioned in the Waiawa Interchange to
2 Hālawā Stream discussion, the Hālawā Stream to Pacific Street section would also pass
3 by the Pearl Harbor National Historic Landmark. As such, the three historic resources
4 identified in that section as within the NHL's boundaries would also be affected in this
5 section (i.e., a publications building, a fuel tank farm, and a splinter-proof air raid
6 shelter).

7 Along the Nimitz Highway portion of the alignment in Kalihi Kai is a group of four
8 historic commercial buildings near Mokauea Street. There is also a small grouping of
9 poultry-industry buildings near Kānānui Street and various industrial facilities along
10 Nimitz Highway. Farther east along the route, approaching its terminus in Iwilei, are the
11 concrete entry gates and wall of the former main entrance to the Kapālama Military
12 Reservation. These are located makai of Nimitz Highway at Waiakamilo Street and now
13 serve as the main entry to Young Brothers Ltd.

14 **Fixed Guideway Alternative**

15 The Fixed Guideway Alternative is divided into five geographical sections. The City and
16 County property record search identified approximately 1,000 pre-1965 tax map lots
17 within the affected environment of this alternative. These properties are not evenly
18 distributed among the proposed transit corridor's various sections. The fewest pre-1965
19 resources are in the Kapolei area (Section I), and the greatest number are in the Honolulu
20 area (Section V). There is roughly the same number of pre-1965 resources (between 140
21 and 173) in Sections II through IV. This distribution pattern is reflective of O'ahu's
22 development history. Table 4-1 summarizes the number of resources by section and by
23 alignment. Because parcels with pre-1965 resources might be affected by several
24 alignments, the total number of such parcels within each section cannot be obtained by
25 adding the numbers given for the various alignments.

1

Table 4-1. Historic Resources in the Area of the Fixed Guideway Alternative

Section and Alignment	Total number of properties meeting 1965 cut-off date	Resources already on NR or HR, or previously determined as eligible	Resources that could be affected*	Total number of Historic Districts affected
I. Kapolei to Fort Weaver Road (5)				
Kamokila Boulevard/ Farrington Highway	0	0	2	0
Kapolei Parkway/ North-South Road	1	0	1	0
Saratoga Avenue/ North-South Road	1	0	3	0
(Saratoga Avenue/) Geiger Road/Fort Weaver Road	3	0	3	0
II. Fort Weaver Road to Aloha Stadium (9)				
Farrington Highway/ Kamehameha Highway	173	0	9	0
III. Aloha Stadium to Middle Street (10)				
Salt Lake Boulevard (Moanalua Freeway)	110	0	3	1 (Palm Circle NHL)
Mauka of the Airport Viaduct	9	0	8	1 (PH NHL*)
Makai of the Airport Viaduct	21	0	8	1 (PH NHL*)
Aolele Street	18	0	8	0
IV. Middle Street to Iwilei (43)				
North King Street	94	3	33	0
Dillingham Boulevard	49	2	12	0
V. Iwilei to UH Mānoa (141)				
Beretania Street/ South King Street	126	16	56	2 (Chinatown HD, Hawai'i Capital HD)
Hotel Street/Kawaiaha'o Street/ Kapi'olani Boulevard	228	33	52	2 (Chinatown HD, Hawai'i Capital HD)
Hotel Street/Waimanu Street/ Kapi'olani Boulevard	205	37	50	2 (Chinatown HD, Hawai'i Capital HD)
Nimitz Highway/Queen Street/ Kapi'olani Boulevard	218	21	45	3 (Chinatown HD, Merchant St. HD, Hawai'i Capital HD)
Nimitz Highway/Halekauwila Street/ Kapi'olani Boulevard	186	15	33	2 (Chinatown HD, Merchant St. HD)
Vaikīkī Spur	33	0	8	0
Total Historic or Potentially Historic Resources: 209				
*Includes pre-1965 properties from the City & County database, plus other properties identified during field surveys.				

Notes on table:

1. PH NHL = Pearl Harbor National Historic Landmark

2. The numbers in parentheses are the total number of resources that meet the 1965 cut-off date for each section. Because some resources are affected by multiple alignments, the numbers in parentheses are typically less than the total of the resources for each section in Column 2.

Summary of Affected Resources (Section I – Kapolei to Fort Weaver Road)

Most of the areas that the various alignments pass through were cultivated in sugar cane until the late 20th century. The only developed area that two alignments cross through is the former Barbers Point Naval Air Station, which was developed in the early 1940s and closed in the late 1990s. There are only four resources in Section I with buildings dating before 1965. None of them have been identified as being on the National or Hawai'i Registers, or have been evaluated as eligible in previous studies. Thus, they were evaluated for National Register eligibility as part of this project. After field surveys (when additional resources were identified), a total of five properties were identified as potentially eligible, or potentially eligible pending further study, for the NRHP in this section. See below for a discussion of these resources and Appendix B for a complete list, with each resource's respective status. There are no National Register Historic Districts close to, or abutting, any of the alignments in Section I.

Five historic resources would be affected by the four alignments in this section of the alternative (Figure 4-3). Most are features of, or are in close proximity to, Kalaeloa, formerly known as Barbers Point Naval Air Station (BPNAS). The following is a summary of resources, by alignment.

Kamokila Boulevard/Farrington Highway

The historic resources that would be affected by this alignment are two historic bridges, both of which are located on Farrington Highway between the developed area of Kapolei and Fort Weaver Road (one at Hono'uli'uli Stream and one near Makalapa Gulch).

Kapolei Parkway/North-South Road

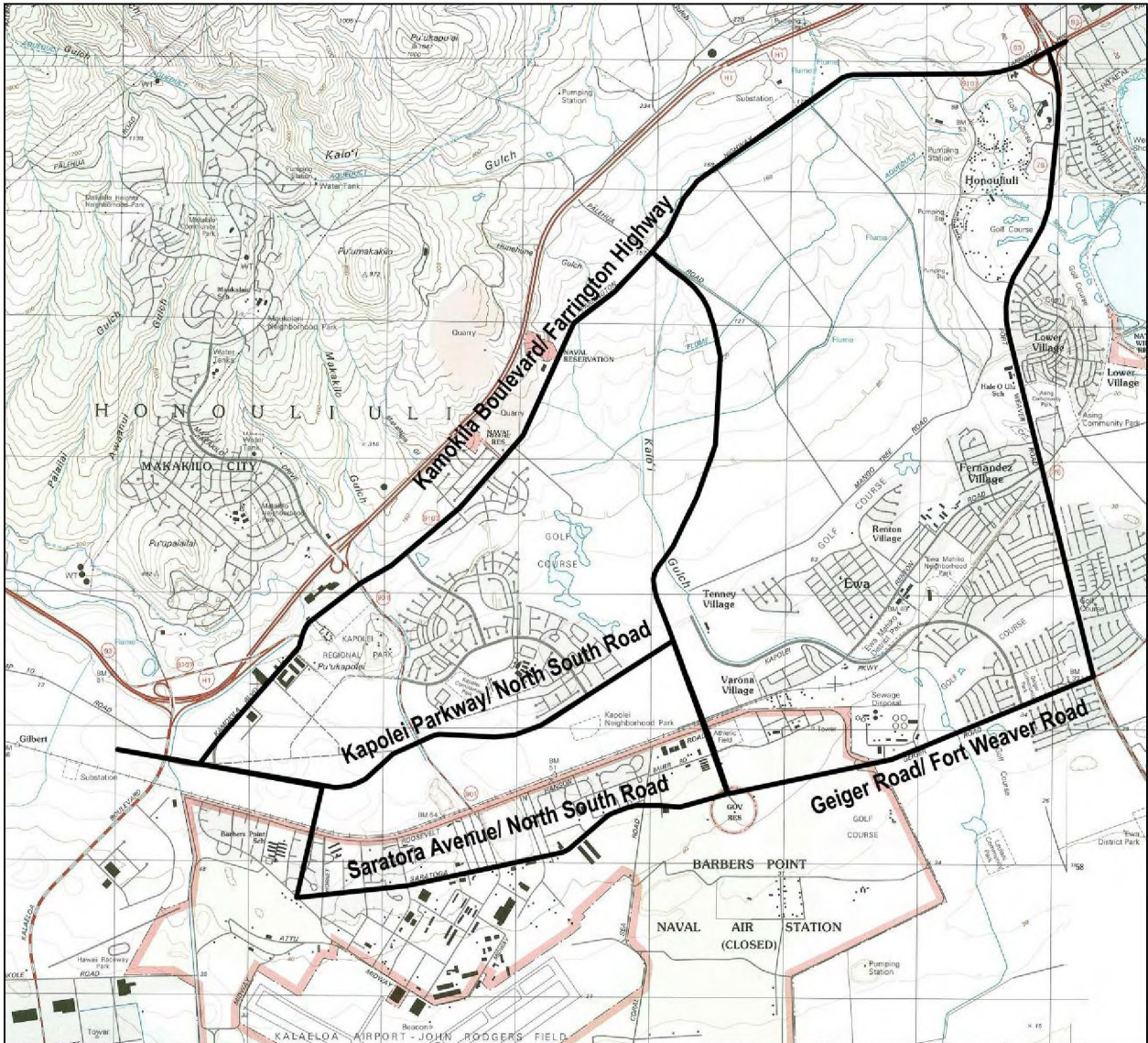
This alignment could affect one historic resource (the bridge over Hono'uli'uli Stream, on Farrington Highway near Fort Weaver Road).

Saratoga Avenue/North-South Road

Two of the three historic resources that would be affected by this alignment are located at Kalaeloa, along Saratoga Road, and are associated with the former Barbers Point Naval Air Station. These are a former Navy housing area and a Cold War-era helicopter hangar. The third historic resource is the Hono'uli'uli Stream Bridge on Farrington Highway, which is also included in the Kapolei Parkway/North-South Road alignment above.

Geiger Road/Fort Weaver Road

This alignment would pass by three historic resources, two which are located at Kalaeloa as discussed above (the former Navy housing area and helicopter hangar). The third historic resource identified in this alignment is a 1943 bridge on Geiger Road, just east of Kalaeloa.



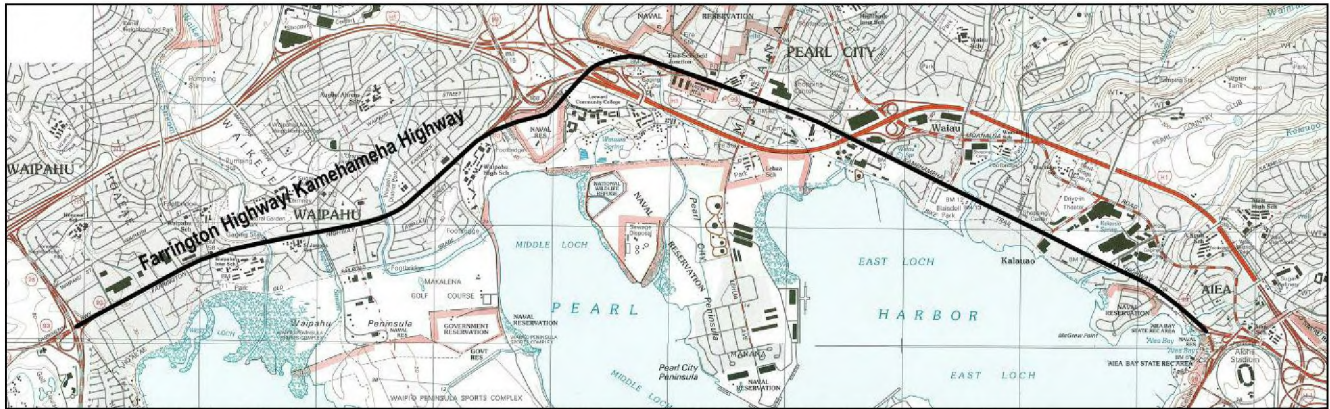
Source: USGS 7.5 Minute Series Topographic Map. 'Ewa (1998), Schofield Barracks (1998) and Pearl Harbor (1999) Quadrangles.

Figure 4-3. Fixed Guideway Section I

Summary of Affected Resources (Section II – Fort Weaver Road to Aloha Stadium)

This section of the Fixed Guideway Alternative has only one alignment – along Farrington and Kamehameha Highways. Beginning at its westernmost end, the alignment would run along Farrington Highway from its intersection with Fort Weaver Road to near the Waiawa Interchange and follow Kamehameha Highway east to Aloha Stadium. It runs through the Pearl City and Waipahu communities, and along the southern edge of 'Aiea. All three towns were established in the late 19th century but have experienced tremendous change and growth, essentially evolving into suburbs that have merged into each other, in the last decades of the 20th century. There are 173 properties in Section II with buildings that fall within the 1965 cut-off date. Most date from the 1950s and 1960s, although a few properties in this section contain buildings

1 dating from the 1930s and 1940s. This same alignment was studied for previous transit
2 projects and no historic resources along these highways were evaluated as being NR
3 eligible. However, because seven years have passed since the last study, these pre-1965
4 properties required evaluation (or re-evaluation, as the case may be) for potential NRHP
5 eligibility as part of this project. A total of nine resources were identified as either
6 potentially eligible or potentially eligible pending further study for the NRHP. Appendix
7 B includes a list of the properties and their Register status. There are no National
8 Register Historic Districts abutting the sole alignment in this section.



Source: USGS 7.5 Minute Series Topographic Map. Schofield Barracks (1998) and Waipahu (1998) Quadrangles.

Figure 4-4. Fixed Guideway Section II

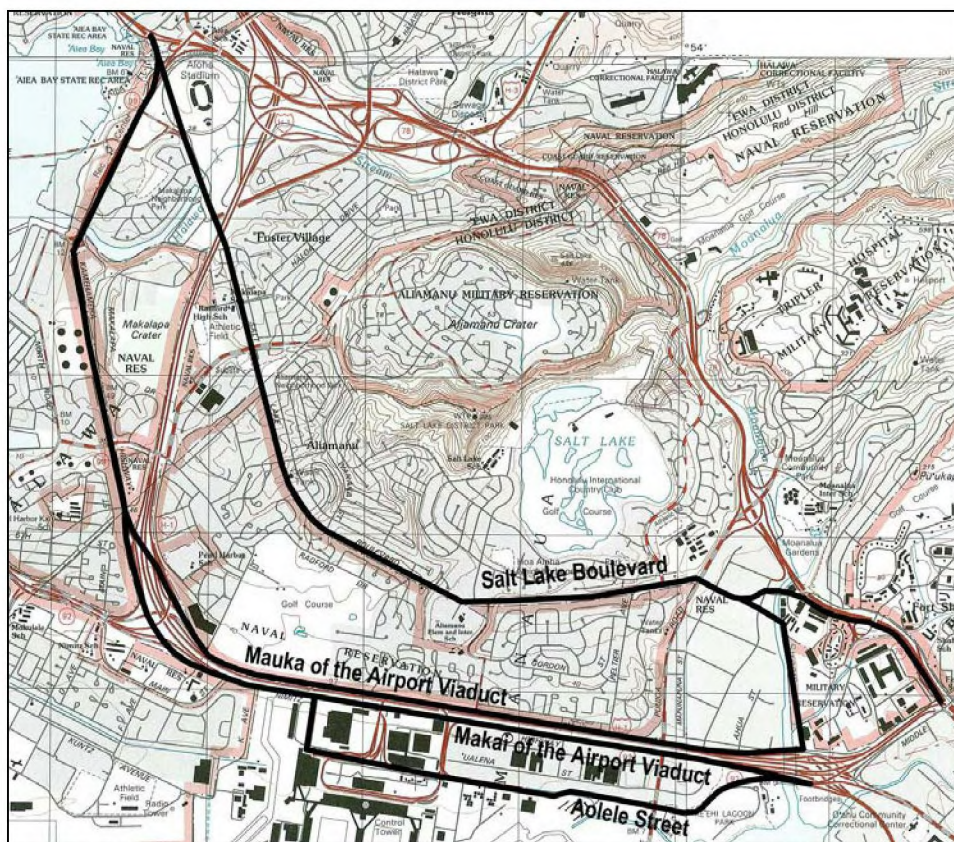
13 The nine historic resources that would be affected by this alignment are distributed
14 somewhat evenly along the route. Seven of the resources are buildings: four churches
15 along Farrington Highway, a restaurant at the alignment's east end, the Waimalu
16 Shopping Center, and the Hawai'iian Electric Company Waiau Power Plant.

17 Near the west end of the alignment, on Farrington Highway, is a concrete bridge over
18 Waikale Stream. The makai span (eastbound Farrington Highway) is elevated high
19 above the stream bed on slender concrete columns and appears to date from ca. 1930s.

20 Near the KoKo Head end of the alignment is Sumida Farm, just mauka of Kamehameha
21 Highway at the Kalauao Spring (for more information on this historic vernacular
22 landscape, see discussion under the Managed Lane Alternative). This property is in a
23 heavily congested commercial area, and its integrity of setting has already been
24 compromised.

Summary of Affected Resources (Section III – Aloha Stadium to Middle Street)

27 In this section, several alignments cross through or along the Pearl Harbor Naval Base,
28 the Salt Lake neighborhood, the industrial areas of Māpunapuna and Honolulu
29 International Airport, and Fort Shafter Military Reservation (Figure 4-5).



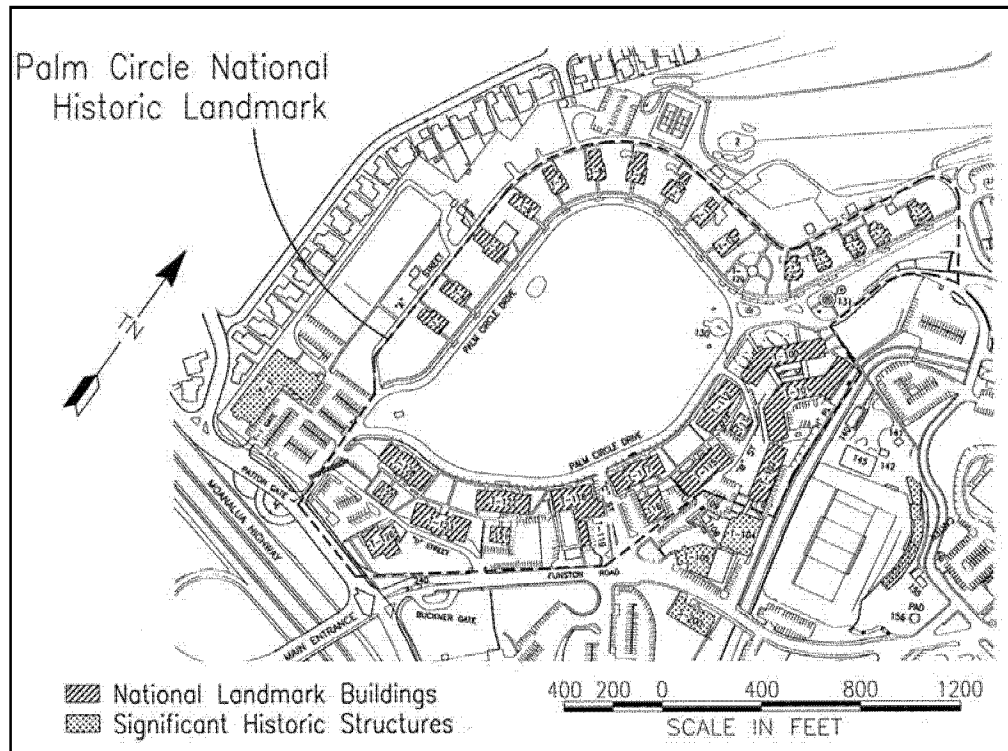
Source: USGS 7.5 Minute Series Topographic Map. Schofield Barracks (1998) and Waipahu (1998) Quadrangles.

Figure 4-5. Fixed Guideway Section III

Most of the outlying housing areas of the U.S. Navy base have been redeveloped in recent decades, and the industrial areas and makai portion of Fort Shafter have also undergone tremendous change in recent decades. In Section III there are 157 properties with pre-1965 resources. The alignment with the greatest number of properties containing pre-1965 resources is the one that includes the entire length of Salt Lake Boulevard. Most properties contain buildings that date from the 1950s and 1960s, although two properties in this section contain buildings dating from the 1940s. Although these alignments have been previously studied, none of these resources have been identified as being on, or evaluated as eligible for, the National or Hawai'i Registers.

As part of this project, these resources were evaluated (or re-evaluated as the case may be) for eligibility. Ten were identified as potentially eligible, potentially eligible pending further study, or already on the National Register of Historic Places as part of the Pearl Harbor NHL. All were added from field observation; there were no historic resources contained in the original list of pre-1965 resources. The 10 resources are distributed somewhat unevenly, with the majority located along the alignments that follow Kamehameha Highway from Aloha Stadium to Honolulu International Airport, along the boundary of the Pearl Harbor NHL. Appendix B contains a full list of these resources, including their Register status.

The Pearl Harbor NHL (Figure 4-2) is passed by all of the alignments except Salt Lake Boulevard. Palm Circle Historic District (Figure 4-6), also a NHL, abuts the alignment that runs along Salt Lake Boulevard.



Source: Integrated Cultural Resources Management Plan for Fort Shafter Military Reservation, Island of O'ahu

Figure 4-6. Palm Circle National Historic Landmark

Palm Circle National Historic Landmark (Figure 4-6) is located in the Fort Shafter Army reservation. It was designated a National Historic Landmark in 1987. Palm Circle Drive surrounds an oval-shaped parade ground lined with royal palms and historic buildings. These buildings, officer housing and administration offices, mostly date from the early 1900s and share the same architectural style. Together, they form one of the oldest and most intact groupings of military buildings in Hawai'i. Palm Circle is also significant for housing the offices and quarters of the Commanding General and his staff, U.S. Army Forces, Pacific Ocean Areas, during World War II. Lieutenant General Robert C. Richardson, Jr., played a critical role in directing U.S. Army personnel in the Pacific realm, overseeing the defense of Pearl and Honolulu Harbors and supervising the construction of the Pineapple Pentagon at Palm Circle for the more efficient conduct of the command's mission.

Salt Lake Boulevard

This alignment would pass by three historic resources. It follows Salt Lake Boulevard, approximately from its intersection with Kamehameha Highway near Aloha Stadium to its termination at Pu'uoloa Road. The alignment then continues Koko Head through Māpunapuna, turning slightly mauka, crossing Moanalua Stream and following the Moanalua Freeway to Middle Street. One of the historic resources at the extreme 'Ewa end of this alignment, just 'Ewa of Aloha Stadium, is the 'Aiea Plantation Cemetery and

1 is comprised of two TMK parcels. The second resource along this route is a Quonset hut
2 located at the Navy Public Works Center. Near the Koko Head end of the alignment is
3 the third historic resource, the Harriet M. Damon Bridge, which crosses the Moanalua
4 Stream (built in 1961).

5 **Mauka of the Airport Viaduct**

6 This alignment, as well as the following two alignments (Makai of the Airport Viaduct,
7 and Aolele Street) would pass by the same eight historic resources. They are all located
8 where the three alignments come together along Kamehameha Highway extending from
9 near Aloha Stadium to Valkenburgh Avenue. The section where these alignments
10 diverge is 'Koko Head of Valkenburgh Avenue, along the Nimitz Highway fronting the
11 airport, where one is routed mauka of the H-1 viaduct, one is routed makai of the H-1
12 viaduct, and one is routed along Aolele Street.

13 Near the 'Ewa end of the alignments is the 'Aiea Plantation Cemetery, which is
14 comprised of two TMK parcels and is near Aloha Stadium. Moving Koko Head, the next
15 historic resource is the 1945 bridge at Hālawā Stream whose mauka span serves the
16 'Ewa-bound lanes of Kamehameha Highway.

17 The remaining historic resources of this alignment are along the Kamehameha Highway
18 Koko Head of the Hālawā Stream Bridge. Two are the historic Navy housing
19 neighborhoods of Makalapa and Little Makalapa, located across Kamehameha Highway
20 from Pearl Harbor Naval Base and National Historic Landmark. Three historic resources
21 lie within the Pearl Harbor NHL, along its Kamehameha boundary: Facility 550, a
22 World War II-era publications office; the remaining components of the Navy's Upper
23 Tank Farm (built for fuel storage in the 1920s); and a World War II-era splinter-proof
24 personnel shelter which is one of the best preserved structures of its type (Mason
25 Architects, 2004). Nearby, just outside the NHL boundary, is a historic Navy Fire
26 Station.

27 **Makai of the Airport Viaduct**

28 The resources along this alignment are the same as the Mauka of the Airport Viaduct
29 alignment.

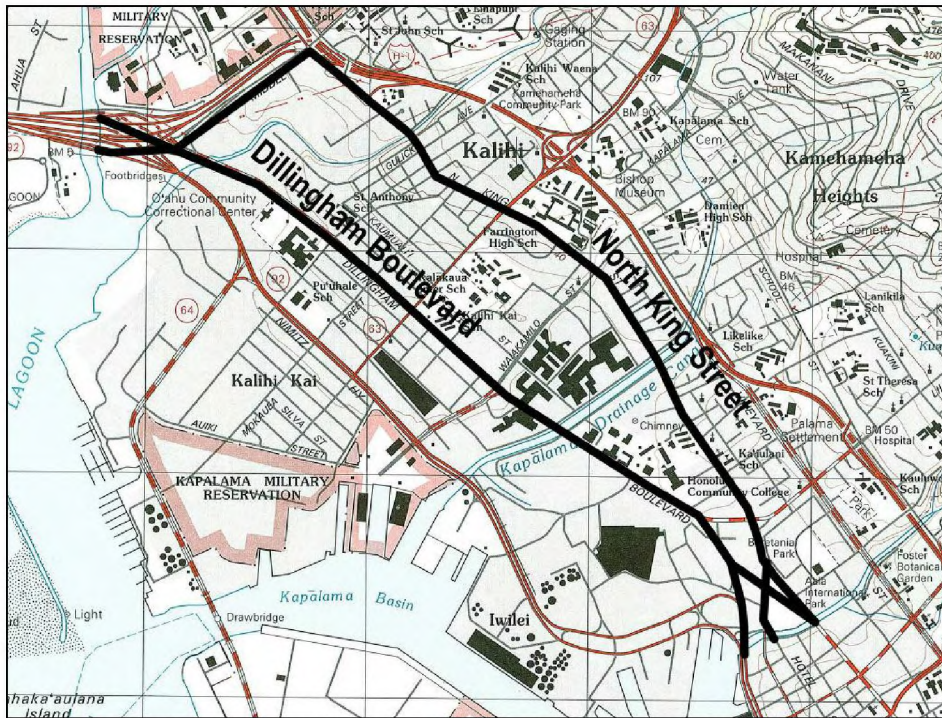
30 **Aolele Street**

31 The resources along this alignment are the same as the Mauka of the Airport Viaduct
32 alignment.

33 **Summary of Affected Resources (Section IV – Middle Street to Iwilei)**

34 The alignments in this section run along Dillingham Boulevard or North King Street,
35 with the optional connector of Middle Street (Figure 4-7). There are 140 properties with
36 pre-1965 buildings in Section IV. These date from the early 1900s through the 1960s.
37 Six historic resources in this section were identified as being on the Hawai'i or National
38 Registers, or as Eligible for the National Register. These are the Tong Fat Company,
39 Ltd., building (National Register Eligible), Farrington High School (Hawai'i Register),

OR&L Office and Document Storage Building (Hawai‘i Register and National Register Eligible), the Pālama Fire Station (Hawai‘i Register and National Register), the Kalihi Fire Station (Hawai‘i Register and National Register), and the Kaumakapili Church (Hawai‘i Register).



Source: USGS 7.5 Minute Series Topographic Map. Honolulu Quadrangle (1998).

Figure 4-7. Fixed Guideway Section IV

The remaining 134 properties were not previously determined eligible or evaluated as eligible. As such, they were evaluated for NRHP eligibility for this project. A total of 37 of these were identified as either potentially eligible, or potentially eligible pending further study, for the National Register. This means that there are a total of 43 historic and potentially historic resources in Section IV. Appendix B contains a list of these resources, with their respective Register status. (Final determination of eligibility will occur after selection of the LPA if the alternative and alignment selected could affect the property.) The resources in Section IV are unevenly distributed; the majority is found along the North King Street alignment (see Table 4-1).

North King Street

The 33 historic resources identified along the North King Street alignment are distributed fairly evenly along most of its length, from Middle Street to its intersection with Dillingham Boulevard. This alignment has a very high percentage of historic lava rock curbs (approximately 60 percent to 70 percent of all curbs along the route). There are two historic bridges: one over Kalihi Stream (built in 1933) and the other which crosses Kapālama Stream (built in 1938).

1 Many of the North King Street resources are standard-type commercial building that
2 appear to be indicative of a trend in either commercial or transportation patterns. These
3 buildings typically have a retail business and storefront on the ground floor and living
4 space on the second floor, and were often built along major transportation routes. They
5 are most common on North and South King Streets, but are not found there exclusively.
6 Extant examples indicate that this type of structure was typically built from the 1930s
7 through the 1960s. More study of their historic context is required to understand the
8 development of this ubiquitous type. Common physical characteristics noted for these
9 buildings are that they are generally two stories and commonly built of plastered
10 masonry, often concrete hollow tiles. They have varying degrees of ornamental detailing
11 and typically exhibit canopies over the sidewalk, clerestory windows either above or
12 below the canopy, chamfered or radiused corner entries, and cargo bays for vehicular
13 traffic to access the rear of the building.

14 Many of the historic resources (approximately 18) are these simple, relatively unadorned
15 commercial buildings. There is a seven-unit cluster of this type of building along the
16 alignment near Gulick and Mokauea Streets, and another cluster between Kapālama
17 Stream and Pālama Street. The second cluster is interspaced with four plantation-type
18 historic single-family residences with vertical-board siding and horizontal girts, wide
19 overhanging eaves, and hip or gable-on-hip roofs.

20 At the ‘Ewa end of this alignment, near North King Street's intersection with Middle
21 Street, are two historic resources that have been identified for acquisition for the fixed
22 guideway system. These are the 1956 Kalihi Shopping Center (one of the few remaining
23 examples of early shopping center designs on O‘ahu) and a single-story commercial
24 building, Leong’s Cafe. It is assumed these buildings would be demolished for the fixed-
25 guideway system.

26 Other notable historic resources on this alignment are the Kalihi Pumping Station of the
27 Board of Water Supply at Houghtailing Street, the 1901 Pālama Fire Station, and the
28 former New Pālama Theater (built in 1930). At the Koko Head end of the alignment, at
29 its intersection with Dillingham Boulevard, is the 1925 O‘ahu Rail & Land terminal
30 building. On the same parcel as the terminal building (TMK 15007001) and facing Iwilei
31 Road are sections of roadway paving blocks made from local basalt stone. These are
32 found along the sidewalk and at the driveway entrance to the parcel from Iwilei Road and
33 are the only known examples of stone roadway paving that remains on O‘ahu. This
34 parcel, TMK 15007001, also lies along the Dillingham Boulevard alignment.

35 **Dillingham Boulevard**

36 This alignment runs adjacent to 12 historic resources, five of which are residential
37 buildings. It also exhibits a significant amount of historic lava rock curbs (approximately
38 40 percent to 60 percent of all curbs along the route).

39 The historic residences are located in a cluster, centered at approximately Mokauea
40 Street. All of the buildings are plantation-style homes, either single-family or duplexes.
41 One parcel (TMK 12002113) contains numerous residential buildings arranged in a

courtyard configuration, with four single-family houses facing Dillingham Boulevard. This courtyard parcel is near the center of the cluster of historic housing resources, with one single-family historic resource Koko Head and two single-family buildings and one duplex building ‘Ewa.

Further Koko Head along the alignment, between Kōkea and Alakawa Streets, is a grouping of six Quonset huts. These are lined up one behind the other, oriented with their long axes parallel to Dillingham Boulevard, with only one Quonset fronting Dillingham Boulevard. These Quonset huts were moved to this location, probably in 1954 (and as such already lack integrity of location). They retain high integrity of design, materials, workmanship, feeling, and association and have value as one of the few surviving groupings of Quonset huts on O‘ahu. While only one Quonset fronts the alignment, the entire grouping would be affected by the fixed guideway system.

As with the North King Street alignment, at the Koko Head end of the Dillingham Boulevard alignment at the intersection with King Street is the 1925 O‘ahu Rail & Land terminal building. On the same parcel (TMK 15007001) as the terminal building and facing Iwilei Road are sections of roadway paving blocks made from local basalt stone. There is additional stone paving fronting the adjacent parcel (TMK 15007002).

The Dillingham Boulevard alignment has one historic bridge resource, the 1930 Kapālama Stream Bridge.

Summary of Affected Resources (Section V - Iwilei to UH Mānoa)

Section V is comprised of many historically rich areas (Chinatown, Downtown, Kaka‘ako, McCully, Mo‘ili‘ili, and Waikīkī), which give it a proliferation of historic resources. Many of the alignments have been studied for previous transit projects (Figure 4-8).

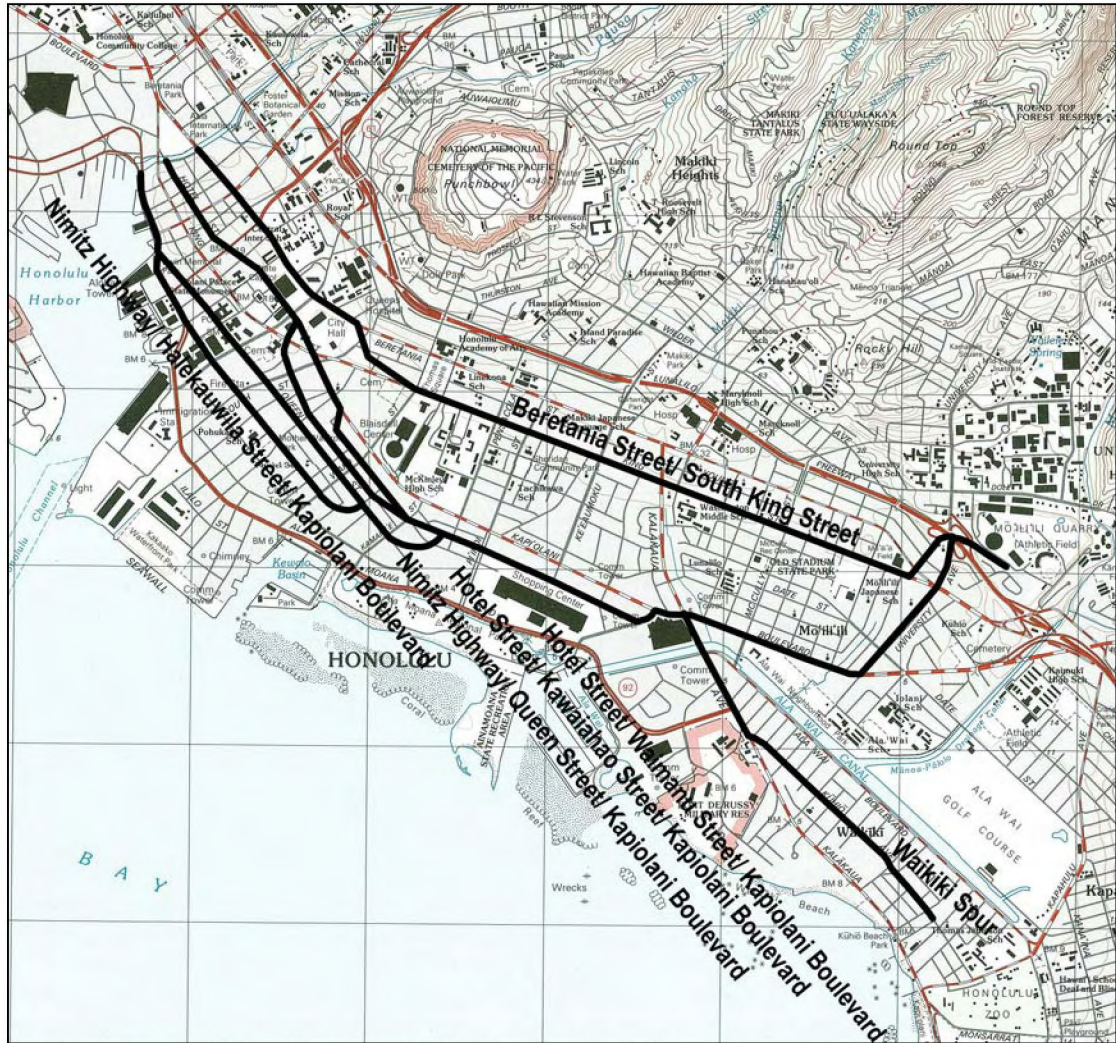
There are 500 properties in Section V that fall within the 1965 cut-off date. Previous studies have identified 67 historic resources in this section that are on the National or Hawai‘i Register, and/or are National-Register eligible. The remaining 433 resources were re-evaluated for this study, and a total of 141 were determined to be potentially eligible, potentially eligible pending further study, or already on one or both of the Registers. Appendix B lists each resource, along with its Register status.

In addition, three National Register Historic Districts are close to, or abut, various alignments in Section V. These districts are shown in Figure 4-9, and Table 4-1 identifies the alignments that could affect each district.

The Chinatown Historic District is in Downtown Honolulu and is generally bounded by Nu‘uanu Avenue, the ‘Ewa side of Nu‘uanu Stream, Beretania Street, and a portion of Honolulu harbor encompassing Piers 13-15 and the edge of Pier 12. The City and County also have established a Chinatown Special Area District that includes essentially the same properties but also includes some lots from the Merchant Street Historic District. Chinatown’s significance is based on its cultural, historical, and architectural

1
2

values. It is historically significant because it is the oldest part of Downtown Honolulu and contains a large concentration of original buildings and uses.

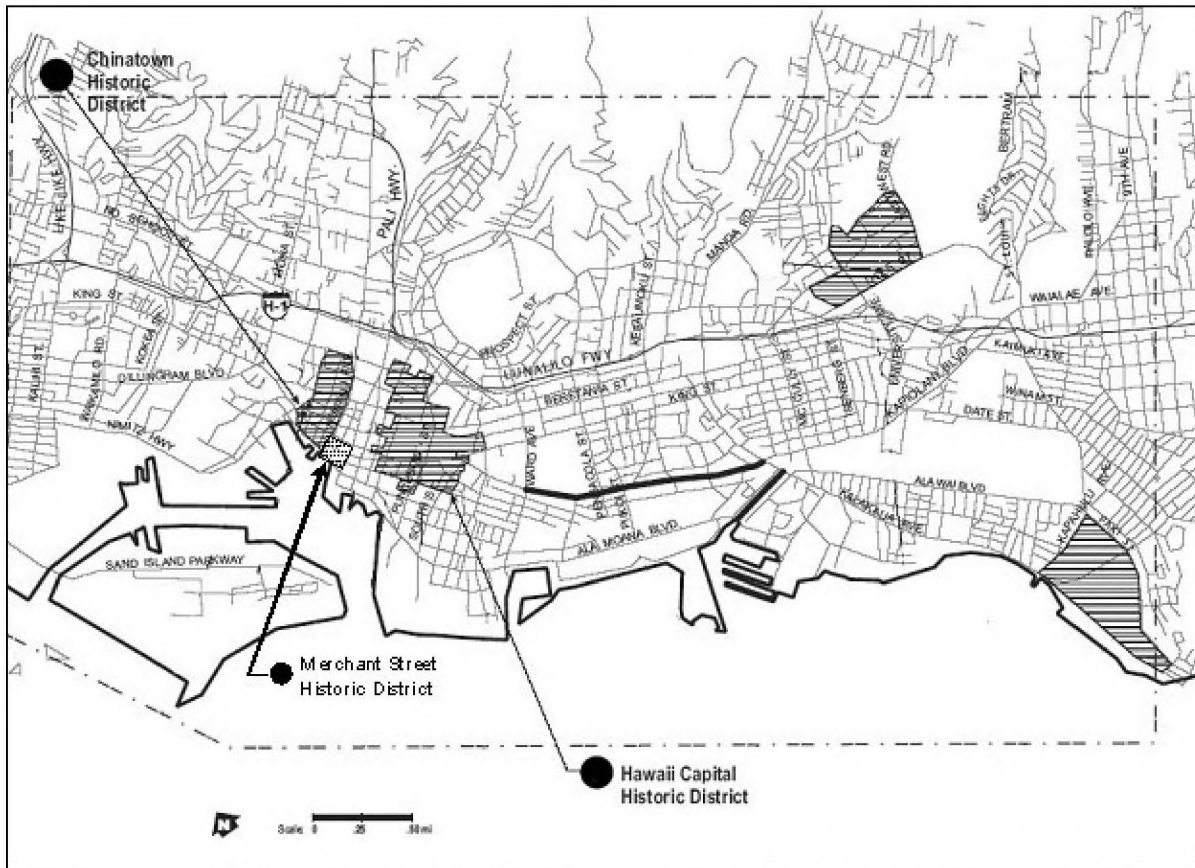


Source: USGS 7.5 Minute Series Topographic Map. Honolulu Quadrangle (1998).

Figure 4-8. Fixed Guideway Section V

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The Merchant Street Historic District (MSHD) consists of several historic buildings in the vicinity of Merchant Street and Nuʻuanu Avenue. The National Register nomination form states that the district's outer limits are the four blocks bounded by King Street, Fort Street, Queen Street, and Nuʻuanu Avenue. The MSHD is historically significant because it represents a cross-section of commercial and government uses dating from 1854 to 1930 in the old downtown area. The district is composed of buildings with high architectural value, with a variety of styles, forms, and materials.



Source: Primary Corridor Transportation Project: Product 7-12, Historic/Cultural Resources Impacts Technical Report, May 1999.

Figure 4-9. Chinatown Historic District, Merchant Street Historic District, and Hawai'i Capital Historic District.

The Hawai'i Capital Historic District includes most of the important civic buildings in the core of Honolulu. The majority of these buildings are government-owned structures, but several are commercial or institutional buildings. Twenty resources were specifically listed in the National Register nomination for this district, but this district actually includes almost 30 resources because several buildings or other resources are included under some of the listed ones. There is a wide range of architectural styles in the district with distinguished examples of Classical Revival, Romanesque, Spanish Mission, Italian Mediterranean, New England Colonial, French Baroque, and Georgian buildings. The significance of this district resides in its architectural and visual character, including its large percentage of open space, as well as its central role in the history of O'ahu and all of the Hawai'iian Islands. Traditionally centralization of government for all of Hawai'i has occurred in Honolulu. This has resulted in an unusual concentration of public and private architecture, spanning the years from 1820 (the Mission Frame house) through 1969 (the State Capitol Building).

Within this section, the various alignments could, in aggregate, affect 141 historic resources, more than any other section of the project. In addition to the high count of

1 historic resources here, this section has an arrangement of alignment options that is more
2 complicated than the other sections. The historic resources are primarily concentrated in
3 two overlapping areas: between Nu‘uanu Stream and Ward Avenue and along the entire
4 length of King Street. Historic resources are found elsewhere in this section, but the bulk
5 of them lie within these two areas. The area from Nu‘uanu Stream to Ward Avenue
6 encompasses portions of all the alignments in Section V, with the exception of the
7 Waikīkī Spur.

8 **Beretania Street/South King Street**

9 This alignment runs adjacent to 56 historic or potentially historic resources, which are
10 distributed evenly along the route from Nu‘uanu Stream to its terminus at the University
11 of Hawai‘i. This alignment has a very high percentage of historic lava rock curbs
12 (approximately 60 percent to 70 percent of all curbs along the route).

13 This alignment can be separated into two segments; the first, at the west end, runs along
14 Beretania Street to the Board of Water Supply near Alapa‘i Street. Sixteen historic
15 resources are found along this segment of the alignment from Nu‘uanu Stream to Alapa‘i
16 Street. Most of this segment is proposed to be tunneled under the street. The historic
17 resources affected by this tunneled section of the alignment include low-rise commercial
18 buildings in Chinatown and Downtown, the 1898 Progress Office Block, the 1936
19 Central Fire Station, Washington Place, St. Andrew's Cathedral, the State Capitol, and
20 the 1941 Mabel Smythe Memorial Building. The alignment is proposed to transition
21 from a tunnel to a surface route along the front of the historic resources of the Board of
22 Water Supply buildings.

23 The second segment of this alignment runs aboveground, along King Street from Alapa‘i
24 Street to almost University Avenue, where it bends mauka, and joins the ‘Ewa ends of the
25 four Hotel Street and Nimitz Highway alignments, and terminates at the University of
26 Hawai‘i. Approximately 40 historic resources would be affected along this segment of
27 the alignment. Most of these resources are the same commercial building type discussed
28 in Section IV along King Street. There is a grouping of nine of such buildings along the
29 alignment between Pensacola and Pi‘ikoi Streets.

30 At the Koko Head end of this alignment, in a portion that is common with the other four
31 alignments of this alternative, are two large-scale historic resources: the Church of the
32 Crossroads (built in 1935 and designed by Claude Stiehl) and the Varsity Theater (built
33 in 1939 and designed by C.W. Dickey). These two buildings are situated where the two
34 alignments converge.

35 **Hotel Street/Kawaiaha‘o Street/Kapi‘olani Boulevard**

36 This alignment is adjacent to 52 historic or potentially historic resources. It runs in
37 tandem with the Hotel Street/Waimanu Street/Kapi‘olani Boulevard alignment from
38 Nu‘uanu Stream to Punchbowl Street, and from Kamake‘e Street to its terminus at the
39 University of Hawai‘i. These alignments have a high percentage of historic lava rock
40 curbs (approximately 50 percent to 60 percent of all curbs along the route).

As noted previously, a high concentration of historic resources is found from Nu‘uanu Stream to Ward Avenue. At the ‘Ewa end of the alignment, the historic King Street bridge over Nu‘uanu Stream borders the Hotel Street routes.

All of the Hotel Street alignments pass through the historic core of Honolulu's Chinatown Historical District, a National Register district since 1973. These properties are generally low-rise, two- or three-story buildings, with retail shops on the ground floor and offices or living quarters above. Several are either vacant, or appear to have vacant second stories. A two-story building at the corner of Hotel Street and Kekaulike Mall was built by the Chinese Lung Doo Benevolent Society and the society's clubhouse is on the second floor above retail space. This historic district is densely urban, and the impact of the aboveground fixed guideway system would be severe on such a compact collection of buildings and narrow streets.

The Koko Head end of this alignment through Downtown would be in a tunnel below the Hawai‘i Capitol Historic District, a National Register District since 1978. This area is less dense than Chinatown, and a large part of its historic character is derived from open areas between the historic buildings.

Moving Koko Head, the portions of the Hotel Street alignments that run through Kaka‘ako, Ala Moana, and Mo‘ili‘ili to Husten Street would impact relatively few historic resources. One historic resource is the Hawai‘ian Life Building at Pi‘ikoi and Kona Streets, which was designed by renowned architect Vladimir Ossipoff. At Kapi‘olani Boulevard and McCully Street is the Ala Wai Park Clubhouse, placed on the National Register in 1988 under the thematic grouping of Art Deco Parks of the City and County of Honolulu. Along University Avenue, centered at Date Street, is a grouping of eight historic resources. These are residential buildings: six single-family homes, one duplex, and one two-story apartment building.

Hotel Street/Waimanu Street/Kapi‘olani Boulevard

This alignment could affect 50 historic or potentially historic resources. It runs in tandem with the Hotel Street/Kawaiaha‘o Street/Kapi‘olani Boulevard alignment from Nu‘uanu Stream to Punchbowl Street, and from Kamake‘e Street to its terminus at the University of Hawai‘i. The concentration of resources in this portion of the alignment is the same as discussed for the preceding alignment.

The portion of the Hotel Street/Waimanu Street/Kapi‘olani Boulevard alignment that runs from Punchbowl Street to Kamake‘e Street would affect few historic resources. The Honolulu Hale and the Mission Houses Memorial Building and Annex are three resources located where the two routes diverge and, therefore, both routes run near them. The alignment would be tunneled under these historic resources. The only other historic resource affected along this portion of the alignment, the Honolulu Advertiser building, would be situated above the tunneled portion of the alignment.

This alignment has a high percentage of historic lava rock curbs (approximately 50 percent to 60 percent of all curbs along the route).

Nimitz Highway/Queen Street/Kapi‘olani Boulevard

This alignment could affect 45 historic or potentially historic resources. At its Koko Head end (Koko Head of Pensacola Street), this alignment follows the same route as the above two alignments with the same historic resources. At the ‘Ewa end of this alignment (from Nu‘uanu Stream to Alakea Street), it either runs in tandem with the Nimitz Highway/Halekauwila Street/Kapi‘olani Boulevard alignment or has historic resources common to both alignments.

This alignment has a high percentage of historic lava rock curbs (approximately 40 percent to 50 percent of all curbs along the route).

One group of seven historic resources in the Koko Head section of this alignment is located along Kekaulike and Mauna Kea Streets and contains the 1916 Schnack Building and the 1911 Kawahara Building along Mauna Kea Street. Both have retail space on the ground floor and offices and living space on the second story. Behind these buildings is the ca. 1919 three-story lava rock and mortar constructed C.Q. Yee Hop building. On Kekaulike Street this group of buildings includes one-, two-, and three-story buildings with retail or commercial space on the ground floors. Nearby is the Nimitz Highway Bridge over Nu‘uanu Stream (built in 1932) and the HFD Waterfront Fire Station at Pier 15 and Pier 13/14.

A section of this alignment runs along Queen Street, and the main area of historic resources along the Queen Street section is at the Koko Head end, from Queen Street's junction with Nimitz Highway to about South Street. Here the alignment could affect 12 historic resources. These include some of the more better-known historic buildings in Downtown, the Capitol District, and surrounding area: C. Brewer, Alexander & Baldwin, Dillingham Transportation, the Post Office, Ali‘iōlani Hale, Hale Auhau, Hawai‘i Department of Transportation, and the Royal Brewery.

Nimitz Highway/Halekauwila Street /Kapi‘olani Boulevard

This alignment could affect 33 historic or potentially historic resources. At its Koko Head end, this alignment runs in tandem with the Nimitz Highway/Queen Street/Kapi‘olani Boulevard alignment, and the discussion of resources for that alignment would apply (see above). These alignments have a high percentage of historic lava rock curbs (approximately 40 percent to 50 percent of all curbs along the route).

At its ‘Ewa end, this alignment runs along Kona Street, Kapi‘olani Boulevard, and University Avenue on the same route as the other Hotel Street and Nimitz Highway alignments. The resources found here are identical to the other alignments and are discussed above for the Hotel Street/Kawaiahau Street/Kapi‘olani Boulevard alignment. The center section of this alignment, running along Nimitz Highway and Halekauwila Street, impacts five historic resources. One of these, the Dillingham Transportation Building, is also affected by the Nimitz Highway/Queen Street/Kapi‘olani Boulevard alignment.

1 The remaining historic resources in this section of the alignment are the mauka portion of
2 the interisland terminal at Pier 11, Irwin Park, and Mother Waldron Park near the 'Ewa
3 end of this alignment.

4 **Waikīkī Spur**

5 This alignment could affect eight historic or potentially historic resources along its route
6 from Kapi'olani Boulevard to its terminus near the end of Kūhiō Avenue. The resources
7 are distributed somewhat unevenly along the alignment: seven are on the Koko Head
8 half of the alignment from Kapi'olani Boulevard to Royal Hawai'ian Avenue and two are
9 near Uluniu Avenue close to the terminus of the route. Two of these resources are
10 simple, unadorned commercial buildings; four are apartment buildings; one is a hotel;
11 one is a ca. 1929 Tudor house converted to retail; and one is a bridge (1929, Kalākaua
12 Bridge over the Ala Wai Canal).

Introduction

Of the approximately 1,000 properties initially identified for this study as meeting the 1965 cut-off date, 209 were subsequently identified as either:

- Resources on the National Register of Historic Places (NRHP) (including those possessing National Historic Landmark status)
- Resources on the Hawai‘i Register of Historic Places (HR)
- Resources that have been officially determined Eligible for the NRHP
- Resources evaluated as potentially eligible for NRHP in this study
- Pre-1965 resources not previously evaluated that may be potentially eligible for NRHP, pending further study.

Appendices A and B include lists of these potentially historic and historic properties.

This chapter includes an introduction to the process of analyzing impacts to these resources, which involves understanding the historic resource’s value, assessing how the undertaking would affect its various aspects of integrity, and identifying the degree to which the integrity would be compromised in respect to 36 CFR §800.5(a)(2) (which defines adverse effects to historic properties under Section 106 of the National Historic Preservation Act). This chapter also identifies impacts that would occur from the operation phase (long-term impacts) and the construction phase, as well as secondary impacts.

The National Register’s criteria for evaluation of historic resources recognize different types of values. The NR significance criteria cover properties:

- A. That are associated with events that have made a significant contribution to the broad patterns of our history or
- B. That are associated with the lives of persons significant in our past or
- C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction or
- D. That have yielded, or may be likely to yield, information important in prehistory or history.

Since historic context studies were not part of the scope of work for this project, the survey of historic resources was limited to identifying those buildings and structures that appeared to possess distinctive characteristics of a type, period, or method of construction (Criterion C). Historic context studies would likely identify additional historic properties for their association with significant events (Criterion A), persons (Criterion B), or an

ability to yield information about history or prehistory (Criterion D). (Note that a separate archaeological survey is also being undertaken for this project that covers the identification and evaluation of below-grade resources that would fall under Criterion D.)

Impacts that decrease the qualities of integrity that qualify a historic resource for inclusion on the NRHP is the focus of this chapter. In assessing eligibility for the National Register, seven aspects of integrity are considered:

- Location: the original location of a historic resource, complemented by its setting, is important in conveying the sense of history
- Setting: the physical environment of a historic resource
- Design: the form, structure, style, and details of a historic resource
- Materials: the physical elements of a historic resource
- Workmanship: evidence of skill or labor in construction of the resource
- Feeling: the expression of a resource's historic sense or the conveyance of its historic character
- Association: the link between the resource and a historic event, trend, or person.

To retain historic integrity a resource must possess several, and usually most, of these aspects. Diminishing these aspects would diminish the eligibility of a historic resource for inclusion on the National Register. Determining which of these are most important to a particular resource requires knowing why the resource is significant. Some of these aspects – design, materials, and workmanship – relate to the actual material portions of the resource and what would be affected by a physical alteration or removal of the resource. “Setting” relates to a resource’s site and surroundings and, combined with the aspects of feeling and association, would be affected by an intrusion or change to the environment around the resource. These aspects of integrity are what would be most affected by this project. Integrity of location would typically not be affected unless relocation were proposed as part of the transit planning or mitigation process. Aspects of design, materials, and workmanship would not be affected except in (unanticipated) circumstances where designs were reconfigured or materials and workmanship were highly altered.

As explained in Chapter 2 (Studies and Coordination), federal agencies have to take into account the effect of their undertakings on historic resources. The regulations covering this process are found in the United States Code of Federal Regulations at 36 CFR, Section 800. According to 36 CFR §800.5(a)(2), adverse effects on historic properties include, but are not limited to, the following:

- Physical destruction of or damage to all or part of the property
- Alteration of a property, including maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with the Secretary’s standards for the treatment of historic properties (36 CFR part 68) and applicable guidelines
- Removal of the property from its historic location

- Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance
- Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features
- Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawai'ian organization and
- Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

The manner in which these adverse effects could manifest under the four alternatives is discussed below.

Alternative 1: No Build

Introduction

The No Build Alternative assumes completion of projects defined in the 2030 O'ahu Regional Transportation Plan (ORTP). Impacts associated with development of the individual projects listed in the ORTP cannot be evaluated because their details are not available. However, the projects will undergo planning and environmental review as part of their individual project development process.

Summary of Affected Resources

The historic resources that could be affected by all of the projects defined in the ORTP in the No Build Alternative are unpredictable and have not been identified as part of this AA.

Construction Impacts

Construction impacts would result from the projects defined in the ORTP. Each project's construction impacts would need to be evaluated separately.

Long-term Impacts

Specific impacts to historic resources would have to be identified in the environmental documentation that would be submitted for permits required for each project implemented as part of the ORTP.

Secondary and Cumulative Impacts

It is difficult to anticipate such impacts at this stage. Specific secondary and cumulative impacts would have to be identified during the permitting stage for each individual project.

Alternative 2: Transportation System Management

Introduction

The details of the physical improvements to roads and highways, such as intersection widening, and the locations of such improvements have not been determined for this alternative.

Summary of Affected Resources

Because the locations for the improvements that comprise this alternative have not been identified, the historic resources that would be affected are unknown.

Construction Impacts

Construction of any new infrastructure could result in some or all of the following impacts:

- Inadvertent collision of equipment and material into the resource
- Collision from overhead debris
- Construction vibration causing direct movement or ground displacement (resulting in settling and movement and possible structural damage to the resource)
- Dewatering from adjacent foundation excavations creating settling and movement beneath historic resources
- Dewatering resulting in the rapid dry rot of any previously submerged timber piles when exposed to air
- High concentrations of dust soiling the exterior or infiltrating the interior and damaging interior architectural features
- Construction noise resulting in owners of historic properties erecting unsightly noise barriers.

Long-term Impacts

If this alternative were selected, specific impacts would have to be determined in the next stage of planning once the details of the alternative are developed. It is anticipated that the majority of impacts associated with this alternative could be related to the capital improvements to selected roadway facilities so that priority can be given to buses. This may include the removal or alteration of historic resources, and possible changes to the resource's setting, feeling, and association as a result of changes in the streetscape.

Secondary and Cumulative Impacts

Specific secondary and cumulative impacts are difficult to anticipate at this stage of planning, so they would have to be analyzed in detail (as required for permitting) if this alternative were chosen.

Alternative 3: Managed Lane

Introduction

Both of the two-lane, grade-separated roadway options for the Managed Lane Alternative could impact the physical environment of the 26 historic resources identified along this route. Impacts to historic resources, as discussed below, would be the same for either option.

Impacts

The historic resources (districts, cemeteries, parks, buildings, bridges, stone paving, curbing, and other such objects) that are considered potentially eligible, potentially eligible pending further study, or already on the Register(s) in this section could face a loss of integrity of setting, feeling, and association. The loss of these aspects of integrity could occur during operation (long-term impacts), construction, or as secondary effects of the project. Below is a summary of these impacts, organized by these three categories.

Potential Long-term Impacts

- Demolition or damage to historic objects, such as lava rock curbs or road paving
- Alterations, such as stabilization efforts/reinforcement, particularly to historic bridges, where such alterations would change their historic appearance
- Direct changes to physical features within a property's setting that contribute to historic significance, specifically infrastructure that is visually incompatible and blocks the view of historic resources (for example, the scale of the infrastructure would overwhelm the historic appearance).

Potential Construction Impacts

- Inadvertent collision of equipment and material into the resource
- Collision from overhead debris
- Construction vibration causing direct movement or ground displacement (resulting in settling and movement and possible structural damage to the resource)
- Dewatering from adjacent foundation excavations creating settling and movement beneath historic resources
- Dewatering resulting in the rapid dry rot of any previously submerged timber piles when exposed to air
- High concentrations of dust soiling the exterior or infiltrating the interior and damaging interior architectural features
- Construction noise altering the feeling of historic areas (particularly residential neighborhoods).

Potential Secondary Impacts

- Changes to a property's use, if owner determines new infrastructure would render existing use incompatible

- Physical changes, if owner alters a property to mitigate the presence of the new infrastructure (sound or visual barriers)
- Change in character of use or demolition, if an environment of increased land values results in the sale of historic properties
- Neglect and possible decay, if increased levels of noise and traffic lead owners to abandon properties.

Alternative 4: Fixed Guideway

Introduction

The Fixed Guideway Alternative could impact the physical environment of 209 historic resources that were identified along its various alignments (Table 5-1). As a means of comparing the relative degree of impact that the various alignments would entail, each has been given a ranking (on a scale of 1 to 3) in the far right column of the table (with 1 being the least degree of impact and 3 being the highest degree of impact). These rankings are preliminary and have not been reviewed or approved by SHPD. As shown in the table, historic resources are more concentrated in Sections IV and V. This pattern reflects O‘ahu’s development history, which began in Downtown Honolulu and branched outward. The alignments within each section that have the least degree of impact are shaded in gray in the table.

In addition to the number of historic or potentially historic resources identified along each alignment, the rankings take into account several other weighting factors. The rankings consider the level of impact that would result from where the system is built (above-grade, at-grade, below-grade) in a particular segment. For example, at-grade segments have been evaluated as posing less impact than elevated segments, and tunneled segments would pose less impact than at-grade segments. The tunneled segments were projected to cause the least amount of impact among these three options since it is assumed that construction damage would be avoided or minimized and, as a result, none of the historic resources adjacent to the tunneled alignments would be affected. The ranking also reflects how many of the resources are already on the National and/or State Registers, as well as the path an alignment takes through a historic district. For example, a lower rank is given when an alignment is adjacent to the outer boundary of a district, compared to an alignment that goes directly through it. An explanation of the relative rankings for each section follows.

Of the four alignments within Section I, the Kapolei Parkway/North-South Road alignment poses the least impact (1) because it is adjacent to only one potentially historic resource. The other three alignments are adjacent to either two or three potentially historic resources. This section contains no properties already listed on the State or National Registers or any historic districts, and the system would be elevated along this section. Therefore these weighting factors do not affect the ranking of the alignments; the relative rankings for this section directly reflect the number of potentially historic resources identified in the survey.

1 Section II contains only one alignment, Farrington Highway/Kamehameha Highway,
2 which is adjacent to nine potentially historic resources. Because there were no other
3 alignments to compare it to, it was not given a ranking.

4 There are four alignments in Section III, all which are proposed to be elevated. Of the
5 four alignments, the Salt Lake Boulevard alignment would result in the least impact (1)
6 since it is adjacent to only three historic or potentially historic resources. It passes
7 adjacent to the outer boundary of the Palm Circle National Historic Landmark, but none
8 of the NHL's resources are near this boundary, so its direct impact to historic resources is
9 insignificant. The three other alignments in Section III each affect eight resources. They
10 also follow the Kamehameha Highway boundary of the Pearl Harbor National Historic
11 Landmark, passing directly in front of some of its historic resources. As such, these three
12 alignments were given a higher ranking (3).

13 Of the two alignments in Section IV, the Dillingham Boulevard alignment was given the
14 lowest ranking (1) in comparison to the ranking of the North King Street alignment (3).
15 This is because the former alignment is adjacent to 12 potentially historic resources (of
16 which only one is on one of the Registers) whereas the latter alignment is adjacent to 33
17 historic resources (of which five are on either the Hawai'i Register or Eligible for the
18 National Register). Since neither of the alignments pass through or near any historic
19 districts and both use elevated systems, the rankings are primarily based on the historic or
20 potentially historic resources located along the alignments.

21 Of the five alignments in Section V, the Nimitz Highway/Halekauwila Street/Kapi'olani
22 Boulevard alignment was given the lowest ranking (1), primarily because it impacts the
23 fewest number of historic resources of any of the alignments. In addition, this alignment
24 avoids many areas with concentrated groups of resources (central Chinatown, South King
25 Street) as well as the Capitol Historic District, which has a number of high profile
26 resources. This alignment does not entirely avoid historic resources, however. Its
27 elevated route goes through the makai side of the Chinatown Historic District, adjacent to
28 10 resources there, and would further isolate that District from its historic connection
29 with the waterfront. It also runs along the border of the Merchant Street Historic District.

30 The remaining alignments in Section V were given the same ranking (3), despite their
31 varied numbers of historic resources, as explained below.

32 The Nimitz Highway/Queen Street/Kapi'olani Boulevard alignment would have the same
33 impacts as the above alignment, but would also affect properties within the Capitol
34 Historic District (Post Office, Ali'i'olani Hale building, and Attorney General's building),
35 and three National Register properties along Queen Street: C. Brewer, A&B, and Royal
36 Brewery buildings. This alignment is at-grade; there are no tunnels proposed that would
37 reduce the numbers of historic resources affected.

38 The two alignments within Section V that follow Hotel Street (Hotel Street/Kawaiaha'o
39 Street/Kapi'olani Boulevard and Hotel Street/Waimanu Street/Kapi'olani Boulevard)
40 have almost identical routes except for a small difference in the numbers of resources
41 occurring where they diverge (the Waimanu Street alignment runs adjacent to the

1 National Register-eligible Honolulu Advertiser Building and the Kawaiaha‘o Street
2 alignment runs adjacent to the National Register-listed properties of Kawaiaha‘o Church
3 and the Mission Houses.) Their Hotel Street segments are both proposed as at-grade
4 systems. This is in context with this street’s history since a streetcar historically ran
5 along it (this precedence notably minimizes, but does not eliminate, the alignment’s
6 impact). Both alignments would be tunneled under the Capitol Historic District, which
7 reduces the number of resources affected to approximately the same number as found
8 along the Nimitz Highway/Queen Street/Kapi‘olani Boulevard alignment. Important
9 resources that are common to both Hotel Street alignments are 18 buildings in the
10 Chinatown Historic District; the National Register-eligible Campbell, McCorriston, and
11 Portland buildings; and three other National Register-listed resources (One Capitol
12 District building, Ala Wai Park Clubhouse, and Church of the Crossroads).

13 The Beretania Street/South King Street alignment within Section V has the highest
14 number of historic resources, but because of the tunneling proposed along the Beretania
15 Street portion of the alignment, fewer resources would be affected. Many of the
16 potentially historic resources identified along King Street are not on either the Hawai‘i or
17 National Registers. Important resources along King Street that are on the National
18 Register are Thomas Square, McKinley High School, and the Board of Agriculture and
19 Forestry building. This alignment also impacts the National Register-listed Church of the
20 Crossroads.

1

Table 5-1. Historic Resources Affected by the Fixed Guideway Alternative

Sections and Alignments (Note: Sections are numbered and in bold)	Total number of resources on NR and/or HR, determined eligible, or evaluated as potentially eligible that could be affected*	Historic Districts that could be affected	Relative Ranking within each section (Scale of 1-3; 1 = least impact, 3 = most impact)
I. Kapolei to Fort Weaver Road (5)			
Kamokila Boulevard/Farrington Highway	2	0	2
Kapolei Parkway/North-South Road	1	0	1
Saratoga Avenue/North-South Road	3	0	3
Geiger Road/Fort Weaver Road	3	0	3
II. Fort Weaver Road to Aloha Stadium (9)			
Farrington Highway/Kamehameha Highway	9	0	Not ranked; no other comparative alignment
III. Aloha Stadium to Middle Street (10)			
Salt Lake Boulevard	3	1 (Palm Circle NHL)	1
Mauka of the Airport Viaduct	8	1 (PH NHL)	3
Makai of the Airport Viaduct	8	1 (PH NHL)	3
Aolele Street	8	1 (PH NHL, via makai connector)	3
IV. Middle Street to Iwilei (43)			
North King Street	33	0	3
Dillingham Boulevard	12	0	1
V. Iwilei to UH Mānoa (141)			
Beretania Street/South King Street	56	2 (Chinatown HD, Hawai'i Capitol HD)	3
Hotel Street/Kawaiaha'o Street/Kapi'olani Boulevard	52	2 (Chinatown HD, Hawai'i Capitol HD)	3
Hotel Street/Waimanu/Kapi'olani Boulevard	50	2 (Chinatown HD, Hawai'i Capitol HD)	3
Nimitz Highway/Queen Street/Kapi'olani Boulevard	45	3 (Chinatown HD, Merchant St. HD, Hawai'i Capitol HD)	3
Nimitz Highway/Halekauwila Street/Kapi'olani Boulevard	33	2 (Chinatown HD, Merchant St. HD)	1
Waikiki Spur	8	0	Not ranked; no other comparative alignment
TOTAL: 209			
*Includes the pre-1965 properties from the City and County database, plus other properties identified during field surveys.			

2 Notes:

3 1. Alignments with the lowest potential impact to historic resources for a given section are shaded in gray.

2. Numbers in parentheses following segment titles are the total number of resources on the NR and/or HR, determined eligible, or evaluated as potentially eligible that could be affected within each section. Because some resources are affected by multiple alignments, the numbers in parentheses are typically less than the total of the resources for each section in column two.

Impacts

Historic resources (districts, cemeteries, parks, buildings, bridges, stone paving, curbing, and other such objects) that are considered potentially eligible, potentially eligible pending further study, or already on the Register(s) in this section could face a loss of integrity of setting, feeling, and association. The loss of these aspects of integrity could occur during operation (long-term impacts), construction, or as secondary effects of the project.

Potential Long-term Impacts

- Demolition or damage to historic objects, such as lava rock curbs or road paving, specifically in the vicinity of stations, where sidewalk levels would have to be modified to allow for access for disabled passengers
- Demolition of two historic buildings (required for right-of-way): Leong's Café and Kalihi Shopping Center, both located in Section IV on North King Street
- Alterations, such as stabilization efforts/reinforcement, particularly to historic bridges, where such alterations would change their historic appearance
- Direct changes to physical features within a property's setting that contribute to historic significance, specifically infrastructure that is visually incompatible and blocks the view of historic resources (for example, the scale of the infrastructure would overwhelm the historic appearance)
- Stations that affect historic resources if they cannot be sited to avoid them (72 historic resources have been identified adjacent to proposed station locations (Table 5-2)).

Table 5-2. Historic Resources Adjacent to Proposed Station Locations

Section and Station Name		Historic Resources' Tax Map Keys (Refer to Appendix B for more information)				
I. Kapolei to Fort Weaver Road						
	No historic resources adjacent to stations in this section					5
II. Fort Weaver Road to Aloha Stadium						
	No historic resources adjacent to stations in this section					6
III. Aloha Stadium to Middle Street						
Kamehameha/Radford Sta.	99001008	99002004				8
IV. Middle Street to Iwilei						
King/Owen Station	12015002	12015005	12016004			9
King/Waiakamilo Station	16021005					10
Dillingham/Middle Station	12013007					
Dillingham/Mokuea Station	12009016	12009017	12009018			11
Dillingham/Kōkeaea Station	15015008					12
Ka'aahihi Station (1)	15007003					13
Ka'aahihi Station (2)	15007001	15007002	15007003			
Ka'aahihi Station (3)	15007002	15007003				
V. Iwilei to UH Mānoa						
Beretania/Fort Station	21009026	21003001	21003005	21003004	21010025	14
King/Pensacola Station	23009001	24002004				15
King/Kalākauaua Station	24006012	24006010				16
King/McCully Station	27001001	28003006				17
King/Hausten Station	28005001					18
University/King Station	28006032	28006017				19
Hotel/Kekaulike Station	17003033	17003025	17003026	17003050	17003037	20
Hotel/Nu'uanunu Station	17003058	17003057	17003056	17003064	21003017	
	21003016	17003007	17003006	17003083	17003004	
Hotel/Bishop Station	21010020	21010013				21
Capitol Station	21024001	21025001	21025002	21033007		22
King/Kapi'olanini Station	21033007	21047004				23
Option 2 McCully Station	27036005					24
University/Date Station	27015011	27015024	27015025	27015026	27015028	25
Nimitz/Kekaulike Station	TMK N/A: King Street Bridge, Nu'uanunu Stream	17002026				26
Queen/Fort Station	21013003	21013001				27
Queen/South Station	21031021	21031018	21032017			28
Nimitz/Fort Station	21013007	21014003				29
Option 2 Convent. Ctr. Sta	23034000					30
Kūhiō/Kālainokuku Station	26017038	26017008				31

Potential Construction Impacts

- Ground displacement and movement of historic properties from tunneling, resulting in structural damage
- Inadvertent collision of equipment and material into the resource
- Collision from overhead debris

- Construction vibration causing direct movement or ground displacement (resulting in settling and movement and possible structural damage to the resource)
- Dewatering from adjacent foundation excavations creating settling and movement beneath historic resources
- Dewatering resulting in the rapid dry rot of any previously submerged timber piles when exposed to air
- High concentrations of dust soiling the exterior or infiltrating the interior and damaging interior architectural features
- Construction noise altering the feeling of historic areas (particularly residential neighborhoods).

Potential Secondary Impacts

- Changes to a property's use if owner determines new infrastructure would render existing use incompatible
- Physical changes if owner alters a property to mitigate the presence of the new infrastructure (sound or visual barriers)
- Change in character of use or demolition if increased land values results in the sale of historic properties
- Neglect and possible decay if increased levels of noise and traffic lead owners to abandon properties.

This chapter is divided into three sections that address mitigation measures for the four alternatives under consideration. Only general mitigation measures are discussed since specific mitigation proposals cannot be made until more detailed decisions on design, routes, and other issues are made. The first section describes ways to avoid impacts to historic resources; the second describes ways to minimize impacts; and the third proposes other mitigation methods, specifically documentation that should take place if avoiding and minimizing impacts are not practicable. After selection of the LPA, specific mitigation measures will be evaluated for any adverse affects to properties identified as eligible for listing on the NRHP.

Avoiding Impacts to Historic Resources

Alternative 1: No Build

Methods of avoiding impacts of this alternative would have to be determined separately for each of the individual projects programmed in the 2030 O‘ahu Regional Transportation Plan.

Alternative 2: Transportation System Management

This alternative has some construction associated with it, primarily capital improvements to selected roadway facilities that would give priority to busses. This construction should be planned to avoid removing or altering historic resources and to minimize any loss of historic character of resources by changing the setting. As with the No Build Alternative, increased vibration from increased traffic could be mitigated by selecting routes that avoid historic resources.

Alternative 3: Managed Lane

Because this alternative proposes only one alignment, it would not be possible to select an alternate route that would not pass in front of historic resources. Avoiding impacts to historic resources altogether would therefore only be possible if a new alignment were designed.

Alternative 4: Fixed Guideway

Where station locations are sited adjacent to historic resources (Table 5-2), the best way to avoid impacts would be to select station locations where there are no adjacent historic resources.

Where the alignment would need to cross a historic bridge, it should be routed to avoid the bridge and make the crossing at another point, leaving the historic bridge intact to carry its intended vehicular traffic.

Minimizing Impacts to Historic Resources

Alternative 1: No Build

Minimization of impacts would have to be determined for each of the projects identified in the 2030 O‘ahu Regional Transportation Plan.

Alternative 2: Transportation System Management

If it is not possible to avoid historic resources for this alternative, it may be feasible to minimize negative impacts by planning large capital improvement projects for areas with fewer historic resources.

Alternative 3: Managed Lane

Construction of a grade-separated roadway would significantly alter areas along this route. Because there is only one proposed alignment for this alternative, the primary method of minimizing impacts to historic resources would be to design a new alignment that would pass fewer historic resources.

Historic properties that are near construction work should be protected from damage. This should include erecting barriers to prevent collision from machinery, equipment, and construction materials, as well as erecting overhead protection of the resource if construction is needed above it. Vibration from nearby construction should be monitored at historic resources to avoid damage either directly (for example from pile driving) or from ground displacement. Dewatering of the ground under historic resources should be prevented by the use of watertight excavation support systems, such as slurry walls, to ensure that water pumped from a construction site does not come from adjacent properties. Dust-suppression measures should be used at construction sites. A monitoring program should be implemented during construction to evaluate the efficacy of protective measures and recommend new ones as needed.

Alternative 4: Fixed Guideway

To minimize impacts to historic resources, fixed-guideway alignments that affect the fewest historic resources should be selected, as identified by gray shading in Table 5-1 in Chapter 5.

Where historic resources are numerous and concentrated (in Downtown Honolulu, the Hawai‘i Capitol Historic District, and the Chinatown Historic District) any alignment would affect the setting of a large number of historic resources. One method of minimizing these impacts would be to place the selected alignment of the fixed-guideway system in a below-grade tunnel, approximately from River Street to South Street/Alapa‘i Street. Careful engineering of the tunnel would be necessary to avoid any damage to foundations or other areas of buildings during construction and operation.

Where this alternative would align with a historic bridge and pose a considerable negative impact to the bridge’s integrity, either by physically altering the structure itself or altering its visual setting, the system should be located and designed in a manner that

1 would help preserve the historic setting and feeling of the structure. The development of
2 design guidelines for such circumstances would help minimize the severity of the impact.

3 Where station and portal entrances would be located within a historic district, such as the
4 Chinatown Historic District and the Hawai‘i Capitol Historic District, they should be
5 designed to integrate into the context of the areas to reduce the severity of the impact.

6 Methods to minimize construction impacts are the same as those discussed for the
7 Managed Lane Alternative, above.

8 **Other Types of Mitigation (Recordation)**

9 Where the grade-separated roadway or selected fixed-guideway alignment would pose a
10 considerable negative impact on historic resources (in particular where the alignment is
11 above-grade and would block the primary façade or view) documentation of the
12 resources prior to construction would be an appropriate method of mitigation.

13 Recordation format could be either Historic American Buildings Survey (HABS) or
14 Historic American Engineering Record (HAER) reports, as appropriate.

15 If station locations cannot be located away from historic resources, interpretive signs
16 could be installed in the stations that are near affected historic resources. These signs
17 could provide historical and architectural information to transit users.

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Appendix A

Historic Resources, Managed Lane

Alternative 3: Managed Lane Historic Resources						
Section	TMK #	Register Status	Historic Resource	Address	Street	Year
Waiawa IC to Hālawā Stream	98018042	PE	Fortyniner Saimin		Kamehameha Hwy	1947
Waiawa IC to Hālawā Stream	98022081	PE	Waimalu Shopping Center		Kamehameha Hwy	1963
Waiawa IC to Hālawā Stream	99012001 & -006	PE/ NMR	'Aiea Plantation Cemetery		Kamehameha Hwy near Aloha Stadium	c. 1896
Waiawa IC to Hālawā Stream	99016047	PE	Sumida Farm		Kamehameha Hwy near Pearl Ridge	1928
Waiawa IC to Hālawā Stream	98003010	PE	HECO	475	Kamehameha Hwy	1959
Waiawa IC to Hālawā Stream Hālawā Stream to Pacific Street	Not applicable	PE/ NMR	Hālawā Stream Bridge		Kamehameha Hwy	1945
Waiawa IC to Hālawā Stream Hālawā Stream to Pacific Street	99001008	NR (NHL)	Bldg 550 Navy Publications Office		Kamehameha Hwy at PH Base	1946
Waiawa IC to Hālawā Stream Hālawā Stream to Pacific Street	99001008	NR (NHL)	Navy Tank farm (fuel storage)		Kamehameha Hwy at PH Base	1924
Waiawa IC to Hālawā Stream Hālawā Stream to Pacific Street	99001008	NR (NHL)	Splinter-proof shelter		Kamehameha Hwy	1942
Hālawā Stream to Pacific Street	12005014	PE	Hulihuli Pacific Poultry		Nimitz Hwy	c. 1958
Hālawā Stream to Pacific Street	15008006	PE	Old Love's Bakery (Salv Army)	322	Sumner St	1932
Hālawā Stream to Pacific Street	15013012	PE/ NMR	1923 oil storage facility		N Nimitz Hwy	1923
Hālawā Stream to Pacific Street	99001008	PE	Bldg 199, Fire Station at Navy Housing Area I		Kamehameha Hwy & Center Dr	1940
Hālawā Stream to Pacific Street	99002004	PE	Makalapa Neighborhood		Kamehameha Hwy	1941
Hālawā Stream to Pacific Street	99002004	PE	Little Makalapa Neighborhood		Kamehameha Hwy & Radford Dr	1941
Hālawā Stream to Pacific Street	12005011	PE	'Ewa Chicken	1804	Kanakanui St	1962
Hālawā Stream to Pacific Street	12005015	PE	Asagi Hatchery	1824	Kanakanui St	1959
Hālawā Stream to Pacific Street	12005039	PE	pōhaku's	1824	Kanakanui St	1959
Hālawā Stream to Pacific Street	15012013	PE	Weyerhaeuser	900	N Nimitz Hwy	1941
Hālawā Stream to Pacific Street	15032002	PE	Kapālama Military Reservation gates		N Nimitz & Waiakamilo Rd	1945
Hālawā Stream to Pacific Street	15033014	PE	Kalihi Kai Fire Station	1334	N Nimitz Hwy	1963
Hālawā Stream to Pacific Street	15035006	PE	Pump house oil storage facility	1824	Kanakanui St	1959
Hālawā Stream to Pacific Street	15037002	PE	Shell Oil bldg	900	N Nimitz Hwy	1941
Hālawā Stream to Pacific Street	Not applicable	PE/ NMR	Kapālama Stream Bridge		Nimitz Hwy	1949
Notes:						

Alternative 3: Managed Lane Historic Resources						
Section	TMK #	Register Status	Historic Resource	Address	Street	Year
1. Shaded resources were added during fieldwork.						
2. Date in bold indicates that the researched date for the resource (shown here) differs from the date in the City and County database.						
		Register Status Codes:				
		PE = Potentially Eligible				
		PE/NMR = Potentially Eligible but Needs More Research to confirm				
		NR (NHL) = National Register (National Historic Landmark)				

Appendix B

Historic Resources, Fixed Guideway

Alternative 4: Fixed Guideway, Section I Historic Resources						
Alignment	TMK #	Register Status	Historic Resource	Address	Street	Year
GR/FWR	Not applicable	PE/ NMR	Geiger Road Bridge		Geiger Rd east of Essex Rd	1945
KB/FH	Not applicable	PE/ NMR	Bridge (Makalapa Gulch)		Farrington Hwy	N/A
SA/NSR, KP/NSR, KB/FH	Not applicable	PE/ NMR	Hono'uli'uli Stream Bridge		Farrington Hwy	N/A
SA/NSR, GR/FWR	91013026	PE	Navy Housing		Saratoga Ave and Lexington Ave	ca. 1950s
SA/NSR, GR/FWR	91013045	PE	Hangar 282		Saratoga Ave near Nassau Ave	1958
Notes:						
1. Shaded resources were added during fieldwork.						
2. Date in bold indicates that the researched date for the resource (shown here) differs from the date in the City and County database.						
Alignment codes:			Register Status Codes:			
KB/FH: Kamokila Boulevard/Farrington Highway			PE = Potentially Eligible			
KP/NSR: Kapolei Parkway/North-South Road			PE/NMR = Potentially Eligible but Needs More Research to confirm			
SA/NSR: Saratoga Avenue/North-South Road						
GR/FWR: Geiger Road/Fort Weaver Road						

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Alternative 4: Fixed Guideway, Section II Historic Resources						
Alignment	TMK #	Register Status	Historic Resource	Address	Street	Year
FH/KH	98018042	PE	Fortyniner Saimin		Kamehameha Hwy	1947
FH/KH	98022081	PE	Waimalu Shopping Center		Hekaha St	1963
FH/KH	99016047	PE	Sumida Farm		Kamehameha Hwy near Pearl Ridge	1928
FH/KH	94010064	PE/ MNR	Iglesia ni Christo Church	94 592	Farrington Hwy	1951
FH/KH	94011056	PE/ NMR	St. Joseph's Church	94 651	Farrington Hwy	1940
FH/KH	94027127	PE/ NMR	West O'ahu Christian Church (round plan)	94 420	Farrington Hwy	1962
FH/KH	94036071	PE/ NMR	Latter Day Saints Church	94 210	Kahualii St	1963
FH/KH	98003010	PE	HECO Plant	475	Kamehameha Hwy	1959
FH/KH	Not applicable	PE/ NMR	Waikele Stream Bridge		Farrington Hwy	N/A
Notes:						
1. Shaded resources were added during fieldwork.						
2. Date in bold indicates that the researched date for the resource (shown here) differs from the date in the City and County database.						
Alignment code:			Register Status Codes:			
FH/KH: Farrington Hwy/Kamehameha Hwy			PE = Potentially Eligible			
			PE/NMR = Potentially Eligible but Needs More Research to confirm			

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Alternative 4: Fixed Guideway, Section III Historic Resources							
Alignment	TMK #	District	Register Status	Historic Resource	Addresses	Street	Year
AS, MAV,MSAV,SLB	99012001 & -006		PE/ NMR	'Aiea Plantation Cemetery		Kamehameha Hwy near Aloha Stadium	c. 1896
AS,MAV,MSAV	99001008	Pearl Harbor National Historic Landmark	NR (NHL)	Bldg 550, Navy Publications Office		Kamehameha Hwy at PH Base	1946
AS,MAV,MSAV	99001008		PE	Bldg 199, Fire Station at Navy Housing Area I		Kamehameha Hwy at Center Drive	1940
AS,MAV,MSAV	99001008	Pearl Harbor National Historic Landmark	NR (NHL)	Navy Tank Farm (fuel storage)		Kamehameha Hwy at PH Base	1924
AS,MAV,MSAV	99001008	Pearl Harbor National Historic Landmark	NR (NHL)	Navy WWII-era splinter-proof shelter		Kamehameha Hwy near Radford PH Base	1942
AS,MAV,MSAV	99002004		PE	Makalapa Navy Housing Area		Kamehameha Hwy at PH Base	1941
AS,MAV,MSAV	99002004		PE	Little Makalapa Navy Housing Area		Kamehameha Hwy and Radford	1941
AS,MAV,MSAV	Not applicable		PE/ NMR	Hālawā Stream Bridge		Kamehameha Hwy	1945
SLB	11010011		PE	Quonset X-24 at Navy Public Works		Salt Lake Blvd at Maluna	1944
SLB	Not applicable		PE/ NMR	Harriet M. Damon Bridge (Moanalua Stream)		Kikowaena St in Māpunapuna	1961
Notes:							
1. Shaded resources were added during fieldwork.							
2. Date in bold indicates that the researched date for the resource (shown here) differs from the date in the City and County database.							
Alignment codes:				Register Status Codes:			
SLB: Salt Lake Boulevard				PE = Potentially Eligible			
MAV: Makai of the Airport Viaduct				PE/NMR = Potentially Eligible but Needs More Research to confirm			
MSAV: Mauka Side of the Airport Viaduct				NR (NHL) = National Register (National Historic Landmark)			
AS: Aolele Street							

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Alternative 4: Fixed Guideway, Section IV Historic Resources

Alignmen t	TMK #	Register Status	Historic Resource	Addres s	Street	Year
DB	12002108	PE	Duarte House	1720	Dillingham Blvd	1925
DB	12002113	PE	Courtyard residences	1808 B	Dillingham Blvd	1922
DB	12009017	PE	House	1953	Dillingham Blvd	1914
DB	12009017	PE	Higa Duplex	1945	Dillingham Blvd	1944
DB	12009018	PE	Teixeira House	1927	Dillingham Blvd	1945
DB	12012014	PE	Pu'u hale Market	608	Pu'u hale Rd	1918
DB	12013006	PE/ NMR	Foremost Dairy	2277	Kamehameha Hwy	1957
DB	12013007	PE/ NMR	GasPro retail store	2335	Kamehameha Hwy	1958
DB	15007002	HR/E	OR&L Office and Document Storage Building and Station	870	Iwilei Rd	1914,1925
DB	15015008	PE	Six Quonset huts	1001	Dillingham Blvd	1954
DB	Not applicable	PE/ NMR	Kapālama Stream Bridge		Dillingham Blvd	1930
DB, NKS	15007001	PE	OR&L basalt paving			ca. 1925
NKS	13005022	HR/NRHP	Kalihi Fire Station		N King St	ca. 1920s
NKS	17031049	HR	Kaumakapili church		Pālana St	1911
NKS	12001041	PE/ NMR	Barber shop	1881	N King St	1948
NKS	12001092	PE	James R. Winston Building	1947	N King St	1948
NKS	12011001	PE	Yamamoto Building	2003	N King St	1923
NKS	12011046	PE/ NMR	Happy Snack Shop	2021	N King St	1929
NKS	12011047	PE	Itoga Building	2037	N King St	1928
NKS	12014049 12015001, -002, -005	PE	Kalihi Shopping Center	2295	N King St	1956
NKS	12016004	PE/ NMR	Leong's Café	2343	N King St	1948
NKS	13002005	PE/ NMR	Total Home Care at PoePoe Pl and N. King	2186	N King St	1940
NKS	13002037	PE	FHB	2250	N King St	1960
NKS	13003026	PE/ NMR	Edward ML Ching Building	1004	Gulick Ave	1951
NKS	13004017	PE/ NMR	O'ahu Noodle Factory	1924	N King St	1946
NKS	13005044	PE/ NMR	Butcher Man and Thrift Shop	1712	N King St	1947
NKS	15003020	PE	Kalihi Pumping Station BoWS Ohrt Museum	1381	N King St	1927
NKS	15004019	PE/ NMR	Hall Saimin and other businesses	925	N King St	1955
NKS	15004021	PE/ NMR	Shonk one-story commercial building	1009	N King St	1946

Alternative 4: Fixed Guideway, Section IV Historic Resources

Alignmen t	TMK #	Register Status	Historic Resource	Addres s	Street	Year
NKS	15005014	HR/NRHP	Pālama Fire Station	879	N King St	1901
NKS	15006033	PE	Zamboanga	701	N King St	1930
NKS	15007003	E	Tong Fat Company, Ltd.	393	N King St	1920
NKS	16001001	PE	Tamashiro Market	802	N King St	1962
NKS	16001002	PE	House on other Wong lot	826	N King St	1924
NKS	16001003	PE	House with concrete garage	842	N King St	1926
NKS	16001013	PE	Siu Hoy/Nakamori House	908	N King St	1910
NKS	16001068	PE	Green Wooden Building	944	N King St	1909
NKS	16001102	PE	Siu Hoy/Miyamoto House	922	N King St	1910
NKS	16001103	PE/ NMR	Family Market	930	N King St	1948
NKS	16002038	PE/ NMR	Agmata	1170	N King St	1937
NKS	16021005	HR	Farrington High School	1101	Kalihi St	1939
NKS	17031048	PE/ NMR	St. Elizabeth's Episcopal Church	720	N King St	1952
NKS	Not applicable	PE/ NMR	Kalihi Stream Bridge		N King St	1933
NKS	Not applicable	PE/ NMR	Kapālama Stream Bridge		N King St	1938

Notes:

1. Shaded resources were added during fieldwork.

2. Date in **bold** indicates that the researched date for the resource (shown here) differs from the date in the City and County database.

Alignment codes:	Register Status Codes:			
DB: Dillingham Boulevard	PE = Potentially Eligible			
NKS: North King Street	PE/NMR = Potentially Eligible but Needs More Research to confirm			
	E = Listed as Eligible for NRHP			
	HR = Listed on Hawai'i Register of Historic Places			
	NRHP = Listed on National Register of Historic Places			

Alternative 4: Fixed Guideway, Section V Historic Resources							
Alignment	TMK #	District	Register Status	Historic Resource	Addr.	Street	Year
All alignments except WS	28006017		HR/NRHP	Church of the Crossroads	1212	University Ave	1935
All alignments except WS	28006032		PE	Varsity Theater	1106	University Ave	1939
BS/SKS	23026001		PE	Washington Middle School		S King St	1939/ 1953
BS/SKS	24001001		NRHP	Thomas Square		S King St	1887/ 1932
BS/SKS	17004018	Chinatown Hist. Dist.	HR/NRHP	Beretania and Maunakea florist	1189	Maunakea St	1918
BS/SKS	17004019	Chinatown Hist. Dist.	HR/NRHP	Quarry-faced stone bldg	79	N Beretania St	1918
BS/SKS	17004036	Chinatown Hist. Dist.	HR/NRHP	Fong bldg	1197	River St	1923
BS/SKS	21003001		PE	Model/Progress Block	1188	Fort St Mall	1898
BS/SKS	21003004		PE	Bethel & Chaplain Ln	1171	Bethel St	1951
BS/SKS	21003005		PE	Schnak bldg Beretania St	1183	Bethel St	1929
BS/SKS	21009026		HR/NRHP	Central Fire Station	116	S Beretania St	1935
BS/SKS	21018001	HI Capitol Hist. Dist	NR	Washington Place	320	S Beretania St	1936
BS/SKS	21018002		PE	St. Andrew's Episcopal Church	1253	Queen Emma St	1934
BS/SKS	21035001		HR/NRHP	Mabel Smythe Memorial Building	510	S Beretania St	1940
BS/SKS	21036004		PE	Board of Water Supply Engineering Bldg	630	S Beretania St	1939
BS/SKS	21036005		PE	Board of Water Supply Administration Bldg	630	S Beretania St	1957
BS/SKS	23009001		HR/ NRHP	McKinley High School	1039	S King St	1945
BS/SKS	23011012		PE/ NMR	Nitta Commercial Building	1103	S King St	1951
BS/SKS	23011013		PE/ NMR	Fukumoto Commercial Building	1111	S King St	1947
BS/SKS	23011014		PE/ NMR	Ishikawa 1-story Commercial Building	1117	S King St	1940
BS/SKS	23011015		PE/ NMR	Chang Commercial Building	1125	S King St	1948
BS/SKS	23011016		PE/ NMR	Chow 1-story Commercial Building	1133	S King St	1950
BS/SKS	23011017		PE/ NMR	Masui 1-story Commercial Building	1145	S King St	1940
BS/SKS	23011018		PE/ NMR	Saiki 1-1/2 Story Commercial Building	1149	S King St	1941
BS/SKS	23011019		PE/ NMR	Wong Commercial Building	1155	S King St	1947

Alternative 4: Fixed Guideway, Section V Historic Resources

Alignment	TMK #	District	Register Status	Historic Resource	Addr.	Street	Year
BS/SKS	23013008		PE/ NMR	Trophy House	1301	S King St	1957
BS/SKS	23013011		PE/ NMR	American Stereo	1327	S King St	1964
BS/SKS	23013034		PE/ NMR	Mediterraneo	1275	S King St	1949
BS/SKS	23018001		PE/ NMR	Prof Center	1479	S King St	1955
BS/SKS	23018010		PE/ NMR	Ikuta Commercial Building	1401	S King St	1955
BS/SKS	23018011		PE/ NMR	Sushi Sasabune	1423	S King St	1960
BS/SKS	23018016		PE	King Center BOH	1451	S King St	1960
BS/SKS	23019001		PE/ NMR	Continental Building	1515	S King St	1955
BS/SKS	23028013		PE	Kimura Florist	1809	S King St	1925
BS/SKS	23028017		PE/ NMR	T. Ishibashi Building	1869	S King St	1962
BS/SKS	23028025		PE/ NMR	King Florist	1915 B	S King St	1945
BS/SKS	24002004		PE	First Chinese Church of Christ	1050	S King St	1930
BS/SKS	24002031		PE	1-story Deco Building	1026	S King St	1951
BS/SKS	24003002		PE/ NMR	Precision Radio	1160	S King St	1950
BS/SKS	24004012		PE	Dr. A Tsuda office	1290	S King St	1917
BS/SKS	24004025		PE/ NMR	Clydes' Cleaners	1234	S King St	1949
BS/SKS	24005018		HR	Territorial Board of Agriculture and Forestry Building	1428	S King St	1961
BS/SKS	24006010		PE/ NMR	Heu Commercial Building	1562	S King St	1940
BS/SKS	24006012		PE	King Kalākaua Building	1534	S King St	1946
BS/SKS	27001001		PE/ NMR	Safety Loan Building	2065	S King St	1964
BS/SKS	27001009		PE	James M. Chrones Building	2017	S King St	1948
BS/SKS	27008017		PE/ NMR	J.C. Tom Building	2239	S King St	1929
BS/SKS	27009034		PE/ NMR	HK Restaurant	2425	S King St	1963
BS/SKS	28001003		PE/ NMR	Miss Hawai'i Building	1738	S King St	1930
BS/SKS	28001006		PE/ NMR	Dental Office in House	1702	S King St	1928
BS/SKS	28001061		PE/ NMR	KNDI Radio	1734 B	S King St	1928
BS/SKS	28002007		PE/ NMR	Tenrikyo Honolulu Church	1902	S King St	1946
BS/SKS	28003006		PE/ NMR	Ishizuchi Shrine	2020	S King St	1962
BS/SKS	28004001		PE/ NMR	Choy Commercial Building	2342	S King St	1955
BS/SKS,HS/KS/KB,HS/W/KB	21007001	HI Capitol Hist. Dist	HR/NRHP	No. 1 Capitol Dist (Armed Forces YMCA)		S. Hotel and Richards Streets	1928

Alternative 4: Fixed Guideway, Section V Historic Resources

Alignment	TMK #	District	Register Status	Historic Resource	Addr.	Street	Year
BS/SKS,HS/KS/KB,HS/W/KB	21024001	HI Capitol Hist. Dist	HR/NRHP	State Capitol		S. Beretania and Hotel Streets	1968
HS/KS/KB,HS/W/KB	17003006	Chinatown Hist. Dist.	HR/NRHP	Smiths Union Bar	15	N. Hotel St	1900
HS/KS/KB,HS/W/KB	17003037	Chinatown Hist. Dist.	HR/NRHP	Siu Bldg		N Hotel St at Maunakea St.	1926
HS/KS/KB,HS/W/KB	17003083	Chinatown Hist. Dist.	HR/NRHP	Hubba Hubba	25	N Hotel St	1900
HS/KS/KB,HS/W/KB	17003097	Chinatown Hist. Dist.	HR/NRHP	Amy's	49	N Hotel St	1900
HS/KS/KB,HS/W/KB	21003017		PE	Perry Block		S Hotel St and Nu'uanu Ave.	1888
HS/KS/KB,HS/W/KB	21010013		E	Portland bldg		S Hotel St & Union Mall	1918
HS/KS/KB,HS/W/KB	21010020		E	McCorriston bldg	1111	Fort St Mall	1914
HS/KS/KB,HS/W/KB	21025001	HI Capitol Hist. Dist	HR/NRHP	State Library		S. King and Punchbowl Streets	1913
HS/KS/KB,HS/W/KB	21032002	HI Capitol Hist. Dist	NR (NHL) /HR	Mission Houses Museum		Mission Ln & S King St	1821 1831
HS/KS/KB,HS/W/KB	17003004	Chinatown Hist. Dist.	HR/NRHP	Bar 35	35	N Hotel St	1935
HS/KS/KB,HS/W/KB	17003007	Chinatown Hist. Dist.	HR/NRHP	Island Keepsakes	1050	Nu'uanu Ave	1914
HS/KS/KB,HS/W/KB	17003015	Chinatown Hist. Dist.	HR/NRHP	Aloha Fashion	1040	Smith St	1908
HS/KS/KB,HS/W/KB	17003016	Chinatown Hist. Dist.	HR/NRHP	Mendonca	1042	Smith St	1906
HS/KS/KB,HS/W/KB	17003025	Chinatown Hist. Dist.	HR/NRHP	Lum Yip Kee	1016	Maunakea St	1936
HS/KS/KB,HS/W/KB	17003026	Chinatown Hist. Dist.	HR/NRHP	Wo Fat	1040	Maunakea St	1938
HS/KS/KB,HS/W/KB	17003031	Chinatown Hist. Dist.	HR/NRHP	Chang Block	182	N King St	1903
HS/KS/KB,HS/W/KB	17003033	Chinatown Hist. Dist.	HR/NRHP	Lung Doo Society	1040	Kekaulike St	1963
HS/KS/KB,HS/W/KB	17003050	Chinatown Hist. Dist.	HR/NRHP	Consuelo Foundation	1110	Maunakea St	1956
HS/KS/KB,HS/W/KB	17003051	Chinatown Hist. Dist.	HR/NRHP	Mendonca	1101	Maunakea St	1901
HS/KS/KB,HS/W/KB	17003056	Chinatown Hist. Dist.	HR/NRHP	Noodle House	1102	Nu'uanu Ave	1901
HS/KS/KB,HS/W/KB	17003057	Chinatown Hist. Dist.	HR/NRHP	Paradise Video	24	N Hotel St	1908
HS/KS/KB,HS/W/KB	17003058	Chinatown Hist. Dist.	HR/NRHP	Peep Show Bld	30	N Hotel St	1907
HS/KS/KB,HS/W/KB	17003064	Chinatown Hist. Dist.	HR/NRHP	Lai Fong	1118	Nu'uanu Ave	1912
HS/KS/KB,HS/W/KB	17003089	Chinatown Hist. Dist.	HR/NRHP	Martial Arts	1041	Maunakea St	1921
HS/KS/KB,HS/W/KB	21002001		E	James Campbell Building	1032	Fort St Mall	1935
HS/KS/KB,HS/W/KB	21003016		PE	McLean Block	1121	Nu'uanu Ave	1903

Alternative 4: Fixed Guideway, Section V Historic Resources

Alignment	TMK #	District	Register Status	Historic Resource	Addr.	Street	Year
HS/KS/KB,HS/W/KB	21025002	HI Capitol Hist. Dist	NR (NHL) /HR	'Iolani Palace complex	364	S King St	1882 (+ various others)
HS/KS/KB,HS/W/KB	21033007	HI Capitol Hist. Dist	HR/NRHP	Mission Mem Bldg	530	S King St	1915/ 1916
HS/KS/KB,HS/W/KB	21033007	HI Capitol Hist. Dist	HR/NRHP	Mission Mem Bldg Annex	530	S King St	1930
HS/KS/KB,HS/W/KB	Not applicable		PE/ NMR	King St Bridge Nu'uuanu Stream		N King St	N/A
HS/KS/KB,HS/W/KB,NH/QS/ KB,NH/HS/KB	Not applicable		PE/ NMR	Makiki Stream Bridge		Kapi'olani Blvd	1931
HS/KS/KB,HS/W/KB,NH/QS/ KB,NH/HS/KB	27036005		HR	Ala Wai Park Clubhouse		Kapi'olani Blvd	1937
HS/KS/KB,HS/W/KB,NH/QS/ KB,NH/HS/KB	23007054		PE/ NMR	Hi-Pace Racing	1246	Kona St & Pi'ikoi	1938
HS/KS/KB,HS/W/KB,NH/QS/ KB,NH/HS/KB	23033045		PE	Nakano Apartment Building	1856	Kapi'olani Blvd	1948
HS/KS/KB,HS/W/KB,NH/QS/ KB,NH/HS/KB	23033046		PE	Rainbow Court Apartment Building	701 5	Hau'oli St	1948
HS/KS/KB,HS/W/KB,NH/QS/ KB,NH/HS/KB	23039023		PE	Hawai'ian Life bldg	1319	Kapi'olani Blvd	1951
HS/KS/KB,HS/W/KB,NH/QS/ KB,NH/HS/KB	27004007		PE	Kapi'olani Apartments	2233	Kapi'olani Blvd	1946
HS/KS/KB,HS/W/KB,NH/QS/ KB,NH/HS/KB	27014002		PE	Fukumoto Apts (courtyard)	2424 C	Kapi'olani Blvd	1948
HS/KS/KB,HS/W/KB,NH/QS/ KB,NH/HS/KB	27014027		PE	Yamato House	642 A	University Ave	1943
HS/KS/KB,HS/W/KB,NH/QS/ KB,NH/HS/KB	27014029		PE	Infiesto House	630	University Ave	1943
HS/KS/KB,HS/W/KB,NH/QS/ KB,NH/HS/KB	27015011		PE	Ing Duplex	707	University Ave	1938
HS/KS/KB,HS/W/KB,NH/QS/ KB,NH/HS/KB	27015024		PE	Ching House	713	University Ave	1943
HS/KS/KB,HS/W/KB,NH/QS/ KB,NH/HS/KB	27015025		PE	Takenaka House	717	University Ave	1943
HS/KS/KB,HS/W/KB,NH/QS/ KB,NH/HS/KB	27015026		PE	Ako House	723	University Ave	1943
HS/KS/KB,HS/W/KB,NH/QS/ KB,NH/HS/KB	27015028		PE	Strohl House	733	University Ave	1944
HS/KS/KB,NH/QS/KB	21032010		PE	American self store	720	South St	1931
HS/KS/KB,NH/QS/KB	21032012		PE	Elizabeth bldg	827	Mission Ln	1911
HS/KS/KB,NH/QS/KB	21032017	HI Capitol Hist. Dist	NR (NHL) /HR	Kawaiaha'o Church		King & Punchbowl Streets	1842

Alternative 4: Fixed Guideway, Section V Historic Resources

Alignment	TMK #	District	Register Status	Historic Resource	Addr.	Street	Year
HS/W/KB	21047004		E	Advertiser Building	605	Kapi'olani Blvd	1930
NH/HS/KB	21013007		HR	Irwin Park		Nimitz Hwy	1930
NH/HS/KB	21051006, - 003 & -019		HR	Mother Waldron Park		Halekauwila St	1937
NH/HS/KB	21001005		PE	Pier 12 Harbors Div DOT	700	Nimitz Hwy	1952
NH/QS/KB	21031021		NRHP	Royal Brewery		Queen St	1900
NH/QS/KB	21013001		HR/NRHP	Alexander & Baldwin Building	141	Merchant St	1929
NH/QS/KB	21013003		NR	C. Brewer Building	827	Fort St Mall	1931
NH/QS/KB	21016009		PE	Catton, Neill & Co. Building	801	Alakea St	1918
NH/QS/KB	21025003	HI Capitol Hist. Dist	HR/NRHP	Ali'iolani Hale	417	S King and Mililani Sts	1874
NH/QS/KB	21025003	HI Capitol Hist. Dist	HR/NRHP	Kapuaiwa Hale	426	Queen St	1884
NH/QS/KB	21025004	HI Capitol Hist. Dist	HR/NRHP	U.S. Post Office, Custom House & Court House	335	Merchant St	1921
NH/QS/KB	21031018		HR/NRHP	Old Kaka'ako Fire Station	620	South St	1929
NH/QS/KB	21049008		HR	Yee/Kobayashi Store	894	Queen St	1918
NH/QS/KB	21050049		PE	Island Roses	905	Queen St	1912
NH/QS/KB	21050052		PE	ASB	929	Queen St	1962
NH/QS/KB	21051001		PE	Kewalo Theatre	711	Queen St	1938
NH/QS/KB,NH/HS/KB	17002013	Chinatown Hist. Dist.	HR/NRHP	C.Q.YeeHop 1919		Maunakea St	1919
NH/QS/KB,NH/HS/KB	21001045		PE	HFD Waterfront Fire Station	111	N Nimitz Hwy	1952
NH/QS/KB,NH/HS/KB	21026022	HI Capitol Hist. Dist	HR/NRHP	Attorney General Offices Hale Auhau	403	Queen St	1939
NH/QS/KB,NH/HS/KB	17002011	Chinatown Hist. Dist.	HR/NRHP	Kawahara	900	Maunakea St	1910
NH/QS/KB,NH/HS/KB	17002016	Chinatown Hist. Dist.	HR/NRHP	Kayas	152	N Nimitz Hwy	1961
NH/QS/KB,NH/HS/KB	17002017	Chinatown Hist. Dist.	HR/NRHP	3-story bldg	919	Kekaulike St	1920
NH/QS/KB,NH/HS/KB	17002024	Chinatown Hist. Dist.	HR/NRHP	Cast-in-place 2-story bldg	950	Maunakea St	1918
NH/QS/KB,NH/HS/KB	17002025	Chinatown Hist. Dist.	HR/NRHP	Schnack Bldg	922	Maunakea St	1915
NH/QS/KB,NH/HS/KB	17002026	Chinatown Hist. Dist.	HR/NRHP	Chinatown Market Place	168	N Nimitz Hwy	1938
NH/QS/KB,NH/HS/KB	21001047		PE	Pier 13/14	65	Nimitz Hwy	1932
NH/QS/KB,NH/HS/KB	21014003		NR	Dillingham Transportation Building	701	Bishop St	1930
NH/QS/KB,NH/HS/KB	21031012		PE	Dept of Transportation	869	Punchbowl St	1959
NH/QS/KB,NH/HS/KB	Not applicable		PE/ NMR	Nu'uuanu Stream Bridge		N Nimitz Hwy	1932

Alternative 4: Fixed Guideway, Section V Historic Resources

Alignment	TMK #	District	Register Status	Historic Resource	Addr.	Street	Year
WS	Not applicable		E	Kalākaua bridge		Ala Wai Canal	1929
WS	26015047		PE	Sofos Building	1984	Kalākaua Ave	1948
WS	26017008		PE/ NMR	Tropic Surf Apts		Kūhiō Ave	1939
WS	26017038		PE	Waikīkī Cove Apartments	2118	Kūhiō Ave	1959
WS	26017051		PE/ NMR	Kūhiō Court	2170	Kūhiō Ave	1959
WS	26019008		PE	Valentine Mall (Tudor-style)	2229	Kūhiō Ave	1929
WS	26023047		PE/ NMR	Royal Grove Hotel	151	Uluniu Ave	1963
WS	26024022		PE	Ka'iulani Court Apts.	209	Ka'iulani Ave	1947

Notes:

1. Shaded resources were added during fieldwork.

2. Date in **bold** indicates that the researched date for the resource (shown here) differs from the date in the City and County database.

Alignment codes:

HS/KS/KB: Hotel Street/Kawaihao St/Kapi'olani Blvd

HS/W/KB: Hotel St/Waimanu/Kapi'olani Blvd

NH/QS/KB: Nimitz Hwy/Queen St/Kapi'olani Blvd

NH/HS/KB: Nimitz Hwy/Halekauwila St/Kapi'olani Blvd

BS/SKS: Beretania Street/South King St

WS: Waikīkī Spur

Register Status Codes:

HR = Listed on Hawai'i Register (very likely to be eligible for the NR)

NHL = Listed on National Register as a National Historic Landmark

NRHP = Listed on National Register of Historic Places

PE = Potentially Eligible

PE/NMR = Potentially Eligible but Needs More Research to confirm

E = Listed as Eligible for NRHP

Draft Historic and Archaeological Technical Report

Part II. Archaeological Technical Report Honolulu High-Capacity Transit Corridor Project

September 1, 2006

Prepared for:
City and County of Honolulu
and
Federal Transit Administration

Prepared by:
Cultural Surveys Hawai'i, Inc.

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Acronyms Used in this Document

AA	Alternatives Analysis
ARPA	Archaeological Resource Protection Act
DBEDT	Department of Business, Economic Development and Tourism
DP	Development Plan
CSH	Cultural Surveys Hawai‘i, Inc.
DLNR	Department of Land and Natural Resources
DTA	Department of Transportation Act
DTS	Department of Transportation Services
EIS	Environmental Impact Statement
FTA	U.S. Federal Transit Administration
GIS	Geographic Information System
HAR	Hawai‘i Administrative Rule
HOV	High Occupancy Vehicle
HRS	Hawai‘i Revised Statutes
LCA	Land Commission Award
NEPA	National Environmental Policy Act
NAGPRA	Native American Grave Protection and Repatriation Act
NHPA	National Historic Preservation Act
OIBC	O‘ahu Island Burial Council
OMPO	O‘ahu Metropolitan Planning Organization
ORTP	O‘ahu Regional Transportation Plan
SHPD	State Historic Preservation Division
SIHP	State Inventory of Historic Places
TMK	Tax Map Key
TSM	Transportation System Management
UH	University of Hawai‘i
USDA	U.S. Department of Agriculture

The City and County of Honolulu Department of Transportation Services (DTS), in coordination with the U.S. Department of Transportation Federal Transit Administration (FTA), is preparing an Alternatives Analysis (AA) and an Environmental Impact Statement (EIS) to evaluate alternatives for the Honolulu High-Capacity Transit Corridor Project that would provide high-capacity transit service on O‘ahu, City and County of Honolulu, Hawai‘i. The alternatives being considered are a No Build Alternative, a Transportation System Management (TSM) Alternative, a Managed Lane Alternative, and a Fixed Guideway Alternative. The primary project study area is the travel corridor between Kapolei and the University of Hawai‘i at Mānoa.

Because the project is receiving federal funds, it must comply with both state and federal historic preservation regulations, including Section 106 of the National Historic Preservation Act (Section 106 NHPA), the National Environmental Policy Act (NEPA), the Department of Transportation Act (DTA), State of Hawai‘i environmental and historic preservation review legislation, and State of Hawai‘i burial law. Additional compliance with the federal Archaeological Resource Protection Act and Native American Graves Protection and Repatriation Act (NAGPRA) may be required pending the investigation, use, and/or appropriation of federal lands.

For this AA, the analysis generally identifies likely impacts for each alternative related to archaeological resources. Three general categories of archaeological resource impacts are identified: burials, pre-contact archaeology, and historic archaeology. With few exceptions, the archaeological resources that could be affected by the project are subsurface features and deposits that have not been previously identified. Such impacts would occur during construction. Once negative impacts from construction (e.g., archaeological resource destruction) and positive impacts from construction (e.g., an increase in archaeological knowledge about O‘ahu’s south shore) have occurred, no long-term project-related impacts are expected on archaeological resources.

Alternative 1, No Build, and Alternative 2, Transportation System Management, may involve construction that could impact archaeological resources; however, these impacts are not considered in this AA because these alternatives would undergo a separate environmental review as part of their planning and implementation. Most areas affected by Alternative 3, Managed Lane, would also be within the area affected by Alternative 4, Fixed Guideway. Depending on the alignment chosen for the Fixed Guideway Alternative, the Managed Lane Alternative may result in fewer impacts on archaeological resources than the Fixed Guideway Alternative (Table S-1).

In relation to archaeological impacts, there are no differences between Managed Lane Alternative 3a, the two-direction option, and 3b, the reversible option. For the section of the Managed Lane Alternative from the Waiawa Interchange to Hālawā Stream, the potential to impact burials is rated as low, and the potential to impact archaeological resources and historic resources is rated as medium. The section of the Managed Lane

Alternative from Hālawā Stream to Pacific Street has a medium rating for all archaeological resource types.

For Section I of the Fixed Guideway Alternative, four alignments are under consideration. The potential for all three types of archaeological resources decreases for alignments in direct correlation with their distance from the coast. Thus, the most *mauka* alignment, Kamokila Boulevard-Farrington Highway, has the least potential to impact archaeological resources. All three *mauka* alignments, Kamokila Boulevard/Farrington Highway, Kapolei Parkway/North-South Road, and Saratoga Avenue/North-South Road, have a low impact potential for all archaeological resource types. The most seaward (seaward) alignment, Geiger Road/Fort Weaver Road, has a medium impact potential for pre-contact archaeological resources, and a low impact potential for burials and historic resources.

Only one alignment is being considered for Section II of the Fixed Guideway Alternative: Farrington Highway-Kamehameha Highway. This alignment has a low impact potential rating for burials, and a medium impact potential rating for pre-contact archaeological and historic resources.

Section III of the Fixed Guideway Alternative has four potential alignments. The impact potential to burials is rated as low for all alignments. The potential to impact archaeological and historical resources along the Mauka (inland) of the Airport Viaduct, Makai (seaward) of the Airport Viaduct, and Aolele Street alignments is rated as medium. For the Salt Lake Boulevard alignment, the potential impact rating for archaeological and historical resources is rated as low, primarily because of the extensive land modification that has occurred in this area.

Section IV of the Fixed Guideway Alternative has two alignments: North King Street and Dillingham Boulevard, both of which have medium impact potential for all archaeological resource types.

Of the five alignments being considered for the Fixed Guideway Alternative, Section V has the greatest potential to impact archaeological resources because of the intensive land use history of the area through pre-contact and historic times. Of the six alignments, the more *mauka* alignment, Beretania Street/South King Street, has a medium impact rating for all archaeological resource types. All other alignments are rated as having a high impact potential for all archaeological resources.

Potential impacts and mitigation are directly correlated, particularly for the project's direct construction impacts on archaeological resources. Archaeological mitigation will likely take the form of burial treatment, archaeological data recovery, and archaeological monitoring. If there is some flexibility in the construction design, it is possible that preservation of archaeological resources in place might be another form of mitigation.

Table S-1. Summary of Potential Impacts to Archaeological Resources

Alternative	Burials	Pre-contact Archaeology	Historic Archaeology
Alternative 1: No Build Alternative			
No Build Alternative	N/A	N/A	N/A
Alternative 2: TSM Alternative			
TSM Alternative	N/A	N/A	N/A
Alternative 3: Managed Lane Alternative (by section)			
3a. Two-Direction Option			
Waiawa IC to Hālawā Stream	Low	Medium	Medium
Hālawā Stream to Pacific Street	Medium	Medium	Medium
3b. Reversible Option			
Waiawa IC to Hālawā Stream	Low	Medium	Medium
Hālawā Stream to Pacific Street	Medium	Medium	Medium
Alternative 4: Fixed Guideway Alternative (by section)			
I. Kapolei to Fort Weaver Road			
Kamokila Boulevard/Farrington Highway	Low	Low	Low
Kapolei Parkway/North-South Road	Low	Low	Low
Saratoga Avenue/North-South Road	Low	Low	Low
Geiger Road/Fort Weaver Road	Low	Medium	Low
II. Fort Weaver Road to Aloha Stadium			
Farrington Highway/Kamehameha Highway	Low	Medium	Medium
III. Aloha Stadium to Middle Street			
Salt Lake Boulevard	Low	Low	Low
Mauka of the Airport Viaduct	Low	Medium	Medium
Makai of the Airport Viaduct	Low	Medium	Medium
Aolele Street	Low	Medium	Medium
IV. Middle Street to Iwilei			
North King Street	Medium	Medium	Medium
Dillingham Boulevard	Medium	Medium	Medium
V. Iwilei to UH Mānoa			
Beretania Street/South King Street	Medium	Medium	Medium
Hotel Street/Waimanu Street/Kapi'olani Boulevard	High	High	High
Hotel Street/Kawaiaha'o Street/Kapi'olani Boulevard	High	High	High
Nimitz Highway/Queen Street/Kapi'olani Boulevard	High	High	High
Nimitz Highway/Halekauwila Street/Kapi'olani Boulevard	High	High	High
Waikikī Spur	High	High	High

The City and County of Honolulu Department of Transportation Services (DTS), in coordination with the U.S. Department of Transportation Federal Transit Administration (FTA), will be preparing an Alternatives Analysis (AA) and an Environmental Impact Statement (EIS) to evaluate alternatives that would provide high-capacity transit service on O‘ahu. The primary project study area is the travel corridor between Kapolei and the University of Hawai‘i at Mānoa (Figure 1-1). This corridor includes the majority of housing and employment on O‘ahu. The east-west length of the corridor is approximately 23 miles. The north-south width of the corridor is at most four miles, as much of the corridor is bounded by the Ko‘olau and Wai‘anae Mountain Ranges to the north and the Pacific Ocean to the south.

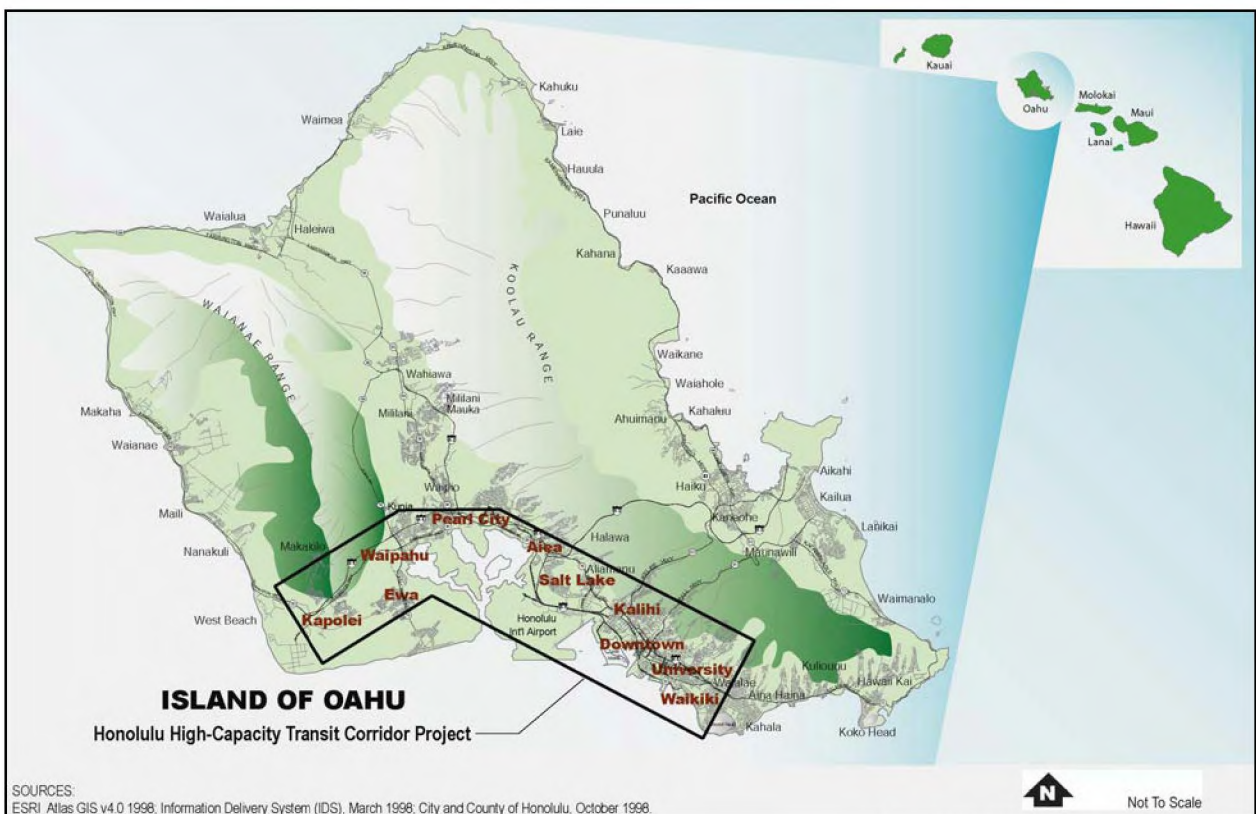


Figure 1-1. Project Vicinity

Project Description

Description of the Study Corridor

The study corridor extends from Kapolei in the west (Wai‘anae or ‘Ewa direction) to the University of Hawai‘i at Mānoa in the east (Koko Head direction), and is confined by the Wai‘anae and Ko‘olau mountain ranges to the north (*mauka* direction) and the ocean to the south (*makai* direction).

The corridor is constrained geographically to a narrow band between the mountains and ocean. In the Pearl City, Waimalu, and ‘Aiea area, the corridor’s width is less than one mile between the Pacific Ocean and the base of the Ko‘olau Mountains.

The General Plan for the City and County of Honolulu directs future population and employment growth to the ‘Ewa, Central O‘ahu, and Primary Urban Center development plan areas, with the highest rate of growth in the ‘Ewa area. The largest increases in population and employment are projected in the ‘Ewa, Waipahu, Downtown, and Kākā‘āko districts, which are all located in the corridor (Figure 1-2).

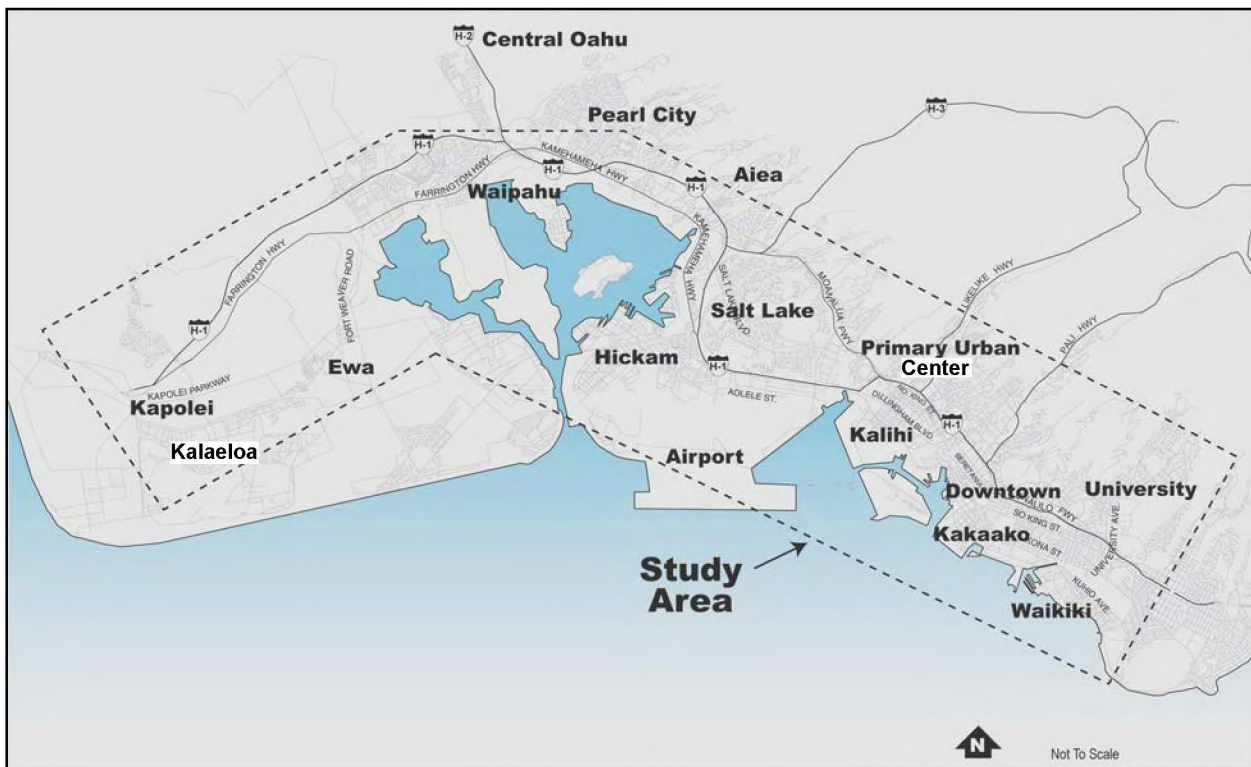


Figure 1-2. Areas and Districts in the Study Corridor

Kapolei is the center of the ‘Ewa development area. It is located in a plain of former sugar cane fields and is rapidly developing. To date, residential development has outpaced commercial development, placing additional commuter pressure on the constrained roadway system serving the area. Kapolei has been designated O‘ahu’s “second city,” and City and State government offices have opened there. The Kalaeloa Community Development District (formerly known as Barbers Point Naval Air Station) consists of several hundred acres adjacent to Kapolei. Several alternatives exist for the redevelopment of this area, including the possibility of developing some of the area for the onshore support of an aircraft carrier with a homeport at Pearl Harbor. The University of Hawai‘i is developing a master plan for a new West O‘ahu campus in Kapolei. The Department of Hawaiian Homelands is also a major landowner in the area, and has plans for shopping center development. Also, developers have several proposals to continue the construction of residential subdivisions.

Continuing Koko Head, the corridor follows Farrington and Kamehameha Highways through a mixture of low-density commercial and residential development. This part of the corridor passes through the *makai* portion of the Central O‘ahu Development Plan area, which lies at the bottom of the valley between the Wai‘anae and Ko‘olau Mountain Ranges. Farrington Highway and the H-1 Freeway are the principal ‘Ewa-Koko Head routes through this part of the corridor.

Moving further Koko Head, the corridor enters the Primary Urban Center Development Plan area. Commercial and residential densities begin to increase in the vicinity of Aloha Stadium. H-1 Freeway, Kamehameha Highway, Salt Lake Boulevard and Moanalua Freeway are the principal ‘Ewa-Koko Head roadways in the western portion of the Primary Urban Center development plan area. The Pearl Harbor Naval Reserve, Hickam Air Force Base, and the Honolulu International Airport border the corridor on the *makai* side. Military and civilian housing are the dominant land uses *mauka* of the H-1 Freeway, with a concentration of high-density housing along Salt Lake Boulevard.

As the corridor continues Koko Head across Moanalua Stream, the land use continues to urbanize with increasing density. There are four principal transportation links through this portion of the corridor: Nimitz Highway, Dillingham Boulevard, North King Street, and the H-1 Freeway. Industrial and port land uses dominate along the harbor, shifting to primarily commercial uses along Dillingham Boulevard, changing to a mixture of residential and commercial uses along North King Street, with primarily residential use *mauka* of the H-1 Freeway.

Koko Head of Nu‘uanu Stream, the corridor continues through Chinatown and downtown. The Chinatown and downtown areas have the highest employment density in the corridor. Streets in this area form an urban grid pattern, with traffic spread over several arterials. The Kākā‘āko and Ala Moana neighborhoods, comprised historically of low-rise industrial and commercial uses, are revitalizing with several high-rise residential towers currently under construction. Ala Moana Center is both a major transit hub and shopping destination.

The corridor continues to Waikīkī and through the McCully neighborhood to the University of Hawai‘i. Today, Waikīkī is one of the densest tourist areas in the world, serving approximately 72,000 visitors daily (DBEDT, 2003). The University of Hawai‘i at Mānoa is the other major destination at the Koko Head end of the corridor. It has an enrollment of over 20,000 students and approximately 6,000 staff (UH, 2005). Approximately 60 percent of the students do not live within walking distance of the campus (UH, 2002) and must travel to attend classes.

Currently, morning travel patterns in the corridor are heavily directional. Morning town-bound traffic volumes through the Waipahu and ‘Aiea areas (Koko Head direction) are more than twice the volume in the ‘Ewa direction. Afternoon flows are less directional with ‘Ewa bound traffic volumes about 50 percent greater than town-bound (Koko Head bound) traffic.

Alternatives under Consideration

Four alternatives will be evaluated in the Alternatives Analysis (AA) report. They were developed through a screening process that considered alternatives identified through previous transit studies, a field review of the study corridor, an analysis of current housing and employment data for the corridor, a literature review of technology modes, work completed by the O‘ahu Metropolitan Planning Organization (OMPO) for its Draft 2030 Regional Transportation Plan, and public and agency comments received during a formal project scoping process held in accordance with requirements of the National Environmental Policy Act (NEPA) and the Hawai‘i EIS Law (Chapter 343). The four alternatives are described in detail in the *Honolulu High-Capacity Transit Corridor Project Alternatives Analysis Definition of Alternatives Report (DTS, 2006a)*. The alternatives identified for evaluation in the AA report are:

- No Build Alternative
- Transportation System Management Alternative
- Managed Lane Alternative
- Fixed Guideway Alternative

Alternative 1: No Build Alternative

The No Build Alternative includes existing transit and highway facilities and committed transportation projects anticipated to be operational by 2030. Committed transportation projects are those programmed in the O‘ahu 2030 Regional Transportation Plan prepared by OMPO. The committed highway elements of the No Build Alternative will also be included in the build alternatives (discussed below).

The No Build Alternative’s transit component would include an increase in fleet size to accommodate growth in population, while allowing service frequencies to remain the same as today. The specific number of buses, as well as required ancillary facilities, will be determined during the preparation of the AA.

Alternative 2: TSM Alternative

The Transportation System Management (TSM) Alternative would provide an enhanced bus system based on a hub-and-spoke route network, conversion of the present morning peak-hour-only zipper-lane to both a morning and afternoon peak-hour zipper-lane operation, and relatively low-cost capital improvements on selected roadway facilities to give priority to buses. The TSM Alternative will include the same committed highway projects as assumed for the No Build Alternative.

Alternative 3: Managed Lane Alternative

The Managed Lane Alternative would include construction of a two-lane, grade-separated facility between Waipahu and Downtown Honolulu for use by buses, para-transit vehicles, and vanpool vehicles. High-occupancy vehicles (HOV) and toll-paying, single-occupant vehicles also would be allowed to use the facility provided that sufficient capacity would be available to maintain free-flow speeds for buses and the above noted

para-transit and vanpool vehicles. Variable pricing strategies for single-occupant vehicles would be implemented to ensure free-flow speeds for high-occupancy vehicles.

Intermediate bus access points would be provided in the vicinity of Aloha Stadium and Middle Street. Bus service utilizing the managed lane facility would be restructured and enhanced, providing additional service between Kapolei and other points 'Ewa of the Primary Urban Center, and downtown Honolulu and the University of Hawai'i at Mānoa.

Alternative 4: Fixed Guideway Alternative

The Fixed Guideway Alternative would include the construction and operation of a fixed-guideway transit system between Kapolei and the University of Hawai'i at Mānoa. The system could use any fixed-guideway transit technology approved by FTA and meeting performance requirements, and could be automated or employ drivers.

Station and supporting facility locations are currently being identified and would include a vehicle maintenance facility and park-and-ride lots. Bus service would be reconfigured to bring riders on local buses to nearby fixed-guideway transit stations.

Although this alternative would be designed to be within existing street or highway rights-of-way as much as possible, property acquisition in various locations is expected. Future extensions of the system to Central O'ahu, East Honolulu or within the corridor are possible, but are not being addressed in detail at present.

A broad range of modal technologies were considered for application to the Fixed Guideway Alternative, including light rail transit, personal rapid transit, automated people mover, monorail, magnetic levitation (maglev), commuter rail, and emerging technologies still in the developmental stage. Several technologies were selected in an earlier screening process and will be considered as possible options for the fixed-guideway technology. Technologies that were not carried forward from the screening process include personal rapid transit, commuter rail, and the emerging technologies. The screening process is documented in the *Honolulu High-Capacity Transit Corridor Project Screening Report* (DTS, 2006b).

The study corridor for the Fixed Guideway Alternative will be evaluated in five sections to simplify analysis and impact evaluation in the AA process and report. In general, each alignment under consideration within each of the five sections may be combined with any alignment in the adjacent sections.

Each alignment has distinctive characteristics, environmental impacts, and provides different service options. Therefore, each alignment will be evaluated individually and compared to the other alignments in each section. The sections that will be evaluated and the alignments being evaluated for each section are listed in Table 1-1.

Table 1-1. Fixed Guideway Alternative Analysis Sections and Alignments

Section	Alignments Being Considered
I. Kapolei to Fort Weaver Road	Kamokila Boulevard/Farrington Highway
	Kapolei Parkway/North-South Road
	Saratoga Avenue/North-South Road
	Geiger Road/Fort Weaver Road
II. Fort Weaver Road to Aloha Stadium	Farrington Highway/Kamehameha Highway
III. Aloha Stadium to Middle Street	Salt Lake Boulevard
	Mauka of the Airport Viaduct
	Makai of the Airport Viaduct
	Aolele Street
IV. Middle Street to Iwilei	North King Street
	Dillingham Boulevard
V. Iwilei to UH Manoa	Beretania Street/South King Street
	Hotel Street/Waimanu Street/Kapi'olani Boulevard
	Hotel Street/Kawaiaha'o Street/Kapi'olani Boulevard
	Nimitz Highway/Queen Street/Kapi'olani Boulevard
	Nimitz Highway/Halekauwila Street/Kapi'olani Boulevard
	Waikiki Spur

Project Purpose

The purpose of the Honolulu High-Capacity Transit Corridor Project is to provide improved mobility for persons traveling in the highly congested east-west transportation corridor between Kapolei and the University of Hawai'i at Mānoa (UH Mānoa), confined by the Wai'anae and Ko'olau Mountain Ranges to the north and the Pacific Ocean to the south. The project would provide faster, more reliable public transportation services in the corridor than those currently operating in mixed-flow traffic. The project would also provide an alternative to private automobile travel and improve linkages between Kapolei, the urban core, UH Mānoa, Waikīkī, and the urban areas in between. Implementation of the project, in conjunction with other improvements included in the O'ahu Regional Transportation Plan (ORTP), would moderate anticipated traffic congestion in the corridor. The project also supports the goals of the O'ahu General Plan and the ORTP by serving areas designated for urban growth.

Project Area Needs

Improved mobility for travelers facing increasingly severe traffic congestion.

The existing transportation infrastructure in this corridor is overburdened handling current levels of travel demand. Motorists experience substantial traffic congestion and delay at most times of the day during both the weekdays and weekends. Transit is caught in the same congestion. Travelers on O'ahu's roadways currently experience 42,000 daily vehicle-hours of delay, which is projected to increase over seven-fold to 326,000 daily vehicle-hours of delay by 2030. Current morning peak-period travel times for motorists from Kapolei to downtown average between 40 and 60 minutes, while recent observations of bus travel times from 'Ewa Beach to downtown ranged from 30 to 80

minutes depending on traffic conditions. By 2030, these travel times are projected to more than double. Within the urban core, most major arterial streets will experience increasing peak period congestion, including Ala Moana Boulevard, Dillingham Boulevard, Kalākaua Avenue, Kapi‘olani Boulevard, King Street and Nimitz Highway. Expansion of the roadway system between Kapolei and UH Mānoa is constrained by physical barriers and by dense urban neighborhoods that abut many existing roadways. Given the current and increasing levels of congestion, a need exists to offer an alternative way to move within the corridor independent from current and projected highway congestion.

Improved transportation system reliability.

As roadways become more congested, they become more susceptible to substantial delays caused by incidents such as traffic accidents or heavy rain. Because of the operating conditions in the study corridor, current travel times are not reliable for either transit or automobile trips. In order to get to their destination on time, travelers have to allow extra time in their schedules to account for the uncertainty of travel time. This is inefficient and results in lost productivity. Because the bus system primarily operates in mixed-traffic, transit users experience the same level of travel time uncertainty as automobile drivers. Recent statistics from TheBus indicate that on a systemwide basis, for all classes of bus routes, 45 percent of buses were on time, 27 percent were more than five minutes late and 28 percent more than one minute early. In the morning peak period, express buses were on time 27 percent of the time, with 38 percent being late and 35 percent being early. A need exists to reduce the variability of transit travel times, and provide a system with increased predictability and reliability.

Accessibility to new development in ‘Ewa/Kapolei/Makakilo as a way of supporting policy to develop the area as a second urban center.

Consistent with the General Plan for the City and County of Honolulu, the highest population growth rates for the island are projected in the ‘Ewa Development Plan area (comprised of the ‘Ewa, Kapolei and Makakilo communities) which is expected to grow by 170 percent between years 2000 and 2030. This growth represents nearly 50 percent of the total growth projected for the entire island. Within this area, Kapolei, which is developing as a “second city” to downtown Honolulu, is projected to grow by 426 percent, the ‘Ewa neighborhood by 123 percent and Makakilo by 94 percent between years 2000 and 2030. Accessibility to the overall 1Ewa Development Plan area is currently severely impaired by the congested roadway network, which will only get worse in the future. This area is less likely to develop as planned unless it is accessible to downtown and other parts of O‘ahu; therefore, the 1Ewa/Kapolei/ Makakilo area needs improved accessibility to support its future growth as planned.

Improved transportation equity for all travelers.

Many lower-income and minority workers live in the corridor outside of the urban core and commute to work in the Primary Urban Center Development Plan Area. Many lower-income workers also rely on transit because they are not able to afford the cost of vehicle ownership and operation. In addition, daily parking costs in downtown Honolulu are among the highest in the United States, further limiting this population’s access to the

downtown. Improvements to transit capacity and reliability will serve all transportation system users, including low-income and under-represented populations.

History of Project

Transit has a long history on O‘ahu starting with the O‘ahu Railway and Land (OR&L) system that carried passengers on approximately 150 miles of track between 1890 and 1947. The route structure included a line in the corridor between ‘Ewa and Honolulu (Chiddix and Simpson, 2004). The Honolulu Rapid Transit and Land (HRT&L) system began operating an electric streetcar system in Honolulu in 1903 and had over 20 miles of lines in operation during its peak. The population of O‘ahu was 59,000 people in 1900, three years before the start of the streetcar system, and had increased to 120,000 by 1920.

Roadway development, buses, and private automobile ownership resulted in decreasing rail-transit demand beginning in the 1920’s. Buses were less expensive to operate than rail-transit. They operated on city streets that were developed and maintained with taxpayer funds, rather than railways that had to be privately developed and maintained. The HRT&L streetcars were completely replaced by buses in 1942. Increasing transportation demand was met in the 1950’s with the development of the H-1 freeway.

The population of O‘ahu kept increasing, from 350,000 people in 1950 to 500,000 in 1960 and 630,000 by 1970. However, despite increasing travel demand, public opposition to extensive freeway expansion began to develop in the early 1960’s. A proposal for an elevated Makai Freeway was abandoned. The island-wide O‘ahu Transportation Study (OTS) that was completed in 1967 concluded that a fixed-guideway transit system, serving a corridor between Pearl City and Hawai‘i Kai, would provide cost-effective transportation capacity as part of a larger transportation system expansion needed to meet increased demand (OTSPC, 1967).

During the early 1970’s, the Preliminary Engineering and Evaluation Program (PEEP) I and PEEP II studies further explored options for a fixed-guideway transit system. Based on these studies, the City and County of Honolulu began planning the Honolulu Area Rail Rapid Transit (HART) project to provide transit in the corridor identified in the 1967 OTS study, Pearl City to Hawai‘i Kai. In 1982, project planning, environmental analysis, and preliminary engineering culminated in a Final Environmental Impact Statement issued by the City and the Urban Mass Transportation Administration (UMTA was the predecessor to the current Federal Transit Administration [FTA]). However, a change in city administration resulted in changed transportation priorities and work on the HART project stopped. O‘ahu’s population continued to increase (in 1980 O‘ahu’s population was 760,000).

In 1985, the City partnered with UMTA to begin a new study for an exclusive right-of-way, fixed-guideway rapid transit project. The Honolulu Rapid Transit Development Project (HRT) built on the planning completed for the HART project, but explored new automated transit technologies. When the Alternatives Analysis/draft Environmental Impact Statement (AA/DEIS) for the project was completed in 1990, the island’s population had grown to 840,000 people.

Later in 1990, following completion of the AA/DEIS, the State Legislature passed funding acts to provide State funds and authorize the City to impose a general use and excise tax surcharge to provide local funding for the project. Local funding was needed to leverage the federal funds that Congress would make available for the project. The City selected a grade-separated, fixed-guideway transit alternative that included a tunnel under downtown, and FTA authorized the City to proceed to preliminary engineering for this alternative (the locally preferred alternative, or LPA).

Over the next two years, the City conducted additional engineering studies and issued a request for proposals to construct the system. Soil conditions in the downtown area and updated financing and environmental impact information resulted in an amendment to the LPA. The project was changed to follow Nimitz Highway on an elevated structure, and a branch line to Waikīkī was eliminated. The FTA and the City issued a Supplemental EIS to address the amended LPA, and the addition of several park-and-ride lots to the project. In 1992, a final EIS was issued on the project. However, the City Council failed to authorize the general use and excise tax surcharge to provide the local funding, and the project collapsed. Federal funds allocated to Honolulu were diverted to cities on the mainland.

During this planning, and while O‘ahu’s population was steadily increasing, the number of trips taken, or “transportation demand,” was increasing at a greater rate than population growth. In 1960, 134,000 automobiles were registered on O‘ahu and residents made a total of 1,190,000 daily person trips. Eleven percent of those trips were made by transit (OTPP, 1967). In 1980, 2,170,000 daily person trips were made and eight percent of those were made by transit (OMPO, 1984). By 1990, there were 613,000 automobiles registered on O‘ahu. Residents made 2,410,000 daily person trips and only seven percent of the trips were made by transit (OMPO, 1995). Between 1960 and 1990, the population of O‘ahu increased by 68 percent, while the number of daily person trips more than doubled, and the number of vehicles registered on the island increased five-fold.

In 1998, the City began developing the O‘ahu Trans 2K Islandwide Mobility Concept Plan. Through an intensive public involvement program, the Plan identified the increasing need for improved mobility and links between land use and transportation. The plan endorsed an integrated transportation approach, with roadway, high-occupancy vehicle, and transit improvements. Once again the need for high-capacity, frequent transit service was identified for the Primary Urban Center. This study led to the Primary Corridor Transportation Project.

Unlike prior projects, the Primary Corridor Transportation Project focused on alternatives that could be constructed within existing transportation rights-of-way to provide mobility improvements at a lower cost and with fewer impacts. A Major Investment Study and draft EIS was completed in 2000, which proposed a system based on bus rapid transit (BRT) operations. The BRT system continued to be developed and refined into the locally preferred alternative addressed in the Final EIS in 2002. The proposed system included Regional and In-Town BRT operations extending from Kapolei to Waikīkī and the University of Hawai‘i at Mānoa.

Some of the Regional and In-Town BRT facilities from the BRT system proposal have been completed. The Hawai‘i Department of Transportation has implemented the extension of the morning “zipper lane” between Radford Drive and Ke‘ehi Interchange. In-Town BRT facilities that have been constructed include seven transit stops and the reconstruction of Kūhiō Avenue between Kalākaua Avenue and Kapahulu Avenue.

The 2030 O‘ahu Regional Transportation Plan includes the afternoon “zipper lane” that was also proposed as part of the regional BRT project. This facility will be included in the No Build and all other alternatives analyzed in this Honolulu High-Capacity Transit Corridor Project. Other elements of the Primary Corridor Transportation Project, such as transit centers, are part of the 2030 O‘ahu Regional Transportation Plan, while others, including additional transit centers and expanded bus service, will be part of the proposed TSM Alternative.

Between 1990 and 2000 the island again experienced travel demand growth that outstripped population growth, with a five percent increase in residents and a 15 percent increase in trips. The population of O‘ahu in the year 2000 was 880,000, residents made 2,760,000 daily person trips, and transit continued to carry seven percent of the total trips (OMPO, 2001).

Transportation demand has continued to increase on O‘ahu since 2000. As part of its work to update the regional transportation plan, OMPO surveyed O‘ahu residents about transportation issues in 2004. The survey identified commute-period traffic congestion in the ‘Ewa and Central O‘ahu to downtown Honolulu corridor as the greatest concern. Nearly twice as many residents responded that improving transit was more important than building more roadways. Seventy percent of the respondents believed that rail rapid transit should be constructed as a long-term transportation solution and 55 percent supported raising taxes to provide local funding for the system.

During the summer of 2005, the State legislature recognized the need and public support for high-capacity transit on O‘ahu and passed Act 247. Act 247 authorized the County to levy a general excise tax surcharge to construct and operate a mass transit project serving O‘ahu. The City Council subsequently adopted Ordinance 05-027 to levy a tax surcharge to fund public transportation. With secure local funding established for the first time; the City began the AA process to implement a high-capacity transit system in the corridor between Kapolei and the University of Hawai‘i at Mānoa. A range of alternatives was evaluated and screened to select alternatives that would provide the most improvement to person-mobility and travel reliability in the study corridor. FTA published a Notice of Intent in the *Federal Register* on December 7, 2005, and DTS published an EIS Preparation Notice (EISPN) in the State of Hawai‘i *Environmental Notice* on December 8, 2005. The public was asked to comment on the selected alternatives, the proposed purpose and need for the project, and the range of issues to be evaluated at a series of scoping meetings held in December 2005.

Project Schedule

Projects developed through the FTA *New Starts* process progress through many stages from system planning to operation of the project. The Honolulu High-Capacity Transit Corridor Project is currently in the Alternatives Analysis phase, which includes defining and evaluating specific projects to address the purpose of and needs for the project discussed earlier in this chapter. The anticipated project development schedule is shown in Figure 1-3.

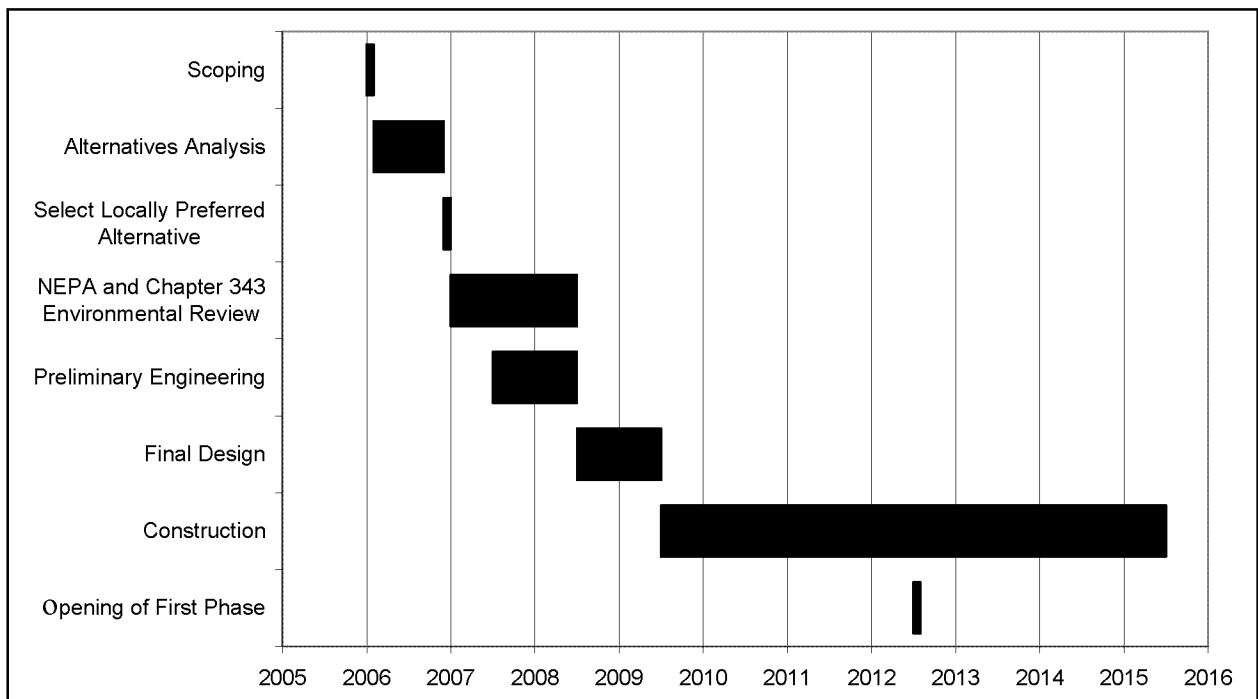


Figure 1-3. Project Schedule

Chapter 1 Introduction References

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Archaeological Resources Regulatory Requirements

Because the Honolulu High-Capacity Transit Corridor Project will receive federal funds, it must comply with Section 106 of the National Historic Preservation Act (Section 106 NHPA), the National Environmental Policy Act (NEPA), and the Department of Transportation Act (DTA). Because portions of the project may involve investigation, use, and/or appropriation of federal lands, for example land from U. S. military installations, compliance with the federal Archaeological Resource Protection Act and Native American Graves Protection and Repatriation Act may be required. Additionally, as a State of Hawai‘i and City and County of Honolulu project within state and county property, the project will be subject to State of Hawai‘i environmental and historic preservation review legislation (Hawai‘i Revised Statutes (HRS) Chapter 343 and HRS 6E-8/Hawai‘i Administrative Rules (HAR) Chapter 13-275, respectively). Compliance with State of Hawai‘i burial law (HRS Chapter 6E-43 and HAR Chapter 13-300) will also likely be necessary. These historic preservation regulations, as they apply to archaeological resources, are described briefly below.

- The National Environmental Policy Act (NEPA 101[b][4]) establishes a federal policy of preserving not only the natural aspects, but also the historic, cultural, and archaeological aspects of our national heritage when undertakings regulated by federal agencies are planned. Implementing regulations (40 CFR Part 1502.16[g]) issued by the Council on Environmental Quality stipulate that the consequences of federal actions on historic, cultural, and archaeological resources be analyzed.
- Section 106 of the National Historic Preservation Act, as amended (NHPA) requires federal agencies to consider the effects of their activities and programs on cultural resources, including archaeological resources, listed on or eligible for listing on the National Register of Historic Places (National Register).
- Section 4(f) of the Department of Transportation Act of 1966, re-codified in 1983 as 49 United States Code, Section 303 (c), established a federal government policy of making special efforts to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites. Section 4(f) stipulates that the U.S. Department of Transportation may approve a program or project that uses or otherwise effects land from any significant historic site, including certain types of archaeological sites, only if two conditions are met. First, there must be no prudent and feasible alternative to the use of the land from the property. Second, the action must include all possible planning to minimize harm to the property resulting from such use.
- The Archaeological Resource Protection Act of 1979 was created in response to congressional recognition that archaeological resources are irreplaceable to the nation’s heritage and that these resources are often accessible, have intrinsic commercial value, and are increasingly endangered by looting and pillage. The legislation protects

archaeological resources that are at least 100 years old and located on Tribal and public lands, including U.S. military installations. The legislation establishes a permitting procedure to regulate the excavation and investigation of applicable archaeological resources. Although possible, it is less likely that project-related archaeological investigations will require an ARPA permit because these investigations would likely be completed under the aegis of a federal contract.

- The Native American Graves Protection and Repatriation Act of 1990 protects Native Hawaiian graves and clarifies the right of ownership of Native Hawaiian human remains and artifacts, including funerary objects, religious objects, and objects of cultural patrimony, found on federal or tribal lands. The legislation outlines procedures for the excavation or removal of Native Hawaiian human remains or cultural artifacts, including the consent of the appropriate Native Hawaiian organizations, and establishes notification requirements for the inadvertent discovery of Native Hawaiian human remains or cultural artifacts.
- Hawai‘i state historic preservation review legislation (HRS Chapter 6E-8 and HAR Chapter 13-275) is designed after federal Section 106 legislation and is applicable to all non-federal land within the state. It describes a process that identifies significant historic properties, including archaeological resources, and develops and executes plans to handle impacts to significant historic properties in the public interest.
- Hawai‘i has specific burial laws (HRS Chapter 6E-43 and HAR Chapter 13-300) pertaining to human remains older than 50 years that are found outside established, maintained cemeteries on non-federal lands within the state. This legislation establishes proper notification and treatment procedures for these burials. This legislation is particularly designed to ensure appropriate and dignified treatment of Native Hawaiian burials discovered through land development projects.

Generally, both State of Hawai‘i and federal historic preservation legislation require the identification, documentation, significance assessment, project effect assessment, and development of appropriate mitigation measures for archaeological resources within a project’s area of potential effect. These procedural steps are carried out through appropriate investigation and through consultation among project proponents, the Hawai‘i State Historic Preservation Officer, and, as appropriate, the Advisory Council on Historic Preservation, interested individuals, and community groups, including Native Hawaiian organizations. The archaeological resource identification and documentation methods for this AA are described in Chapter 3. These methods were discussed with the Office of Hawaiian Affairs in late January 2006 and the State Historic Preservation Division (SHPD) in early February 2006. Response to this approach was positive.

Alternative Analysis Technical Report

For this *Archaeological Technical Report*, an extensive survey of previously identified and potential archaeological resources within the study area was made. This “broad-brush” approach will not identify all documented or potential archaeological resources, but will characterize the potential for different project alignments to affect archaeological

resources. Based on this characterization, recommendations will be made to contribute to the selection of a Locally Preferred Alternative.

The archaeological resources investigation for this AA is structured to initiate the overall project's compliance with both federal and State of Hawai'i historic preservation review legislation. Given the number of alternatives and degree of uncertainty regarding the eventual selection of a Locally Preferred Alternative, it is not possible for the AA to fulfill the requirements of the applicable historic preservation legislation. Instead, the level of effort will be sufficient to generally identify likely problems for each alternative to meet the various federal and state historic preservation regulations pertaining to archaeological resources.

For the subsequent draft EIS, which will be focused on the Locally Preferred Alternative's area of potential effect, a detailed archaeological inventory survey plan will be generated as the first step in the project's formal historic preservation compliance effort. Because there is much uncertainty regarding the Locally Preferred Alternative, postponing the formal start of historic preservation compliance to the draft EIS stage allows for more flexibility and a more appropriate allocation of resources required for the archaeological resource identification effort. Because of the probable diversity, distribution, and number of archaeological resources within the Locally Preferred Alternative, an archaeological inventory survey plan will serve to effectively coordinate the effort. The plan will include detailed procedures for the identification, documentation, significance evaluation, and assessment of project effect for the archaeological resources within the Locally Preferred Alternative (per the requirements of HAR Chapter 13-275 and 13-276). The inclusion of the archaeological inventory survey plan in the draft EIS will ensure appropriate agency and public review of the proposed archaeological resource identification effort.

Archaeological Investigations Associated with Prior High-Capacity Rapid Transit Environmental Documentation

The environmental documentation that accompanied prior proposed high-capacity transit service along the south shore of O‘ahu, including most recently PrimCor (Davis and McGerty, 2002) and the earlier Honolulu Rapid Transit (Rosendahl, 1988) provided varying consideration of potential impacts to archaeological resources. Although these archaeological studies focused on different areas of O‘ahu’s south shore, the overall study corridors overlap substantially. These earlier studies served as a starting point for the archaeological resource analysis for this project.

A wealth of previous archaeological research has been carried out within the proposed project’s study area. J.G. McAllister conducted some of the earliest archaeological documentation within the study area in the early 1930s as part of his archaeological and ethnographic survey of O‘ahu (McAllister, 1933). Sterling and Summers (1978) collected information on many of the early sites identified by the Bernice P. Bishop Museum (including sites identified by McAllister) in their book “Sites of O‘ahu.” Already documented archaeological resources within the study area span nearly the entire history of human habitation of O‘ahu and include remnants of filled fishponds, human burials, subsurface cultural layers related to traditional Native Hawaiian occupation, historic building and structure foundations, and historic trash pits and privies. Various low-energy alluvial deposits also contain paleoenvironmental information that pertains to the history of human land use along the south O‘ahu shoreline.

Archaeological Approach for “Affected Environment” and “Impacts”

For this *Archaeological Technical Report*, an extensive, inclusive survey of potential archaeological resources within the study area has been made. This analysis is presented in two sections, Chapter 4, “Affected Environment” and Chapter 5, “Impacts.”

Chapter 4, “Affected Environment” is based on a “broad-brush” approach to archaeological resources that did not identify all documented or potential archaeological resources, but rather characterized the potential for different project alignments to affect archaeological resources. Chapter 4 lists all archaeological projects within the Tax Map Key (TMK) plats through which the study area passes. Using the TMK plat as the unit of search yielded a large data set, including projects that are not directly pertinent to the study area (e.g., projects conducted within the plat but not close to any of the alternative alignments). In addition, archaeological studies that did not include any field work, such as data recovery plans, monitoring plans, and literature searches, and other reports not based on actual fieldwork, are included in Chapter 4. This resulted in a bibliography of more than 550 entries.

Chapter 5, “Impacts” is a refinement of the data set presented in Chapter 4. For the tables in Chapter 5, only archaeological reports that included some fieldwork are included. Reports on archaeological projects conducted within the tax map plats, but which did not record any sites near the alternative alignments were winnowed out. This was accomplished by reviewing all available pertinent reports at the SHPD office in Kapolei, examining the project location, and reviewing any site maps (if any sites were recorded).

Available archaeological information was reduced into a form that provides sufficient detail to evaluate potential impacts to archaeological resources along the various alignments within the study area.

Alternatives Analysis Phase Methodology

In general, archaeological and historic background research and limited field inspection has been used to identify previously documented archaeological resources and areas of potential archaeological resources within the proposed study area. Based on available data, the potential affected environment and impacts of project construction on archaeological resources within various portions of the study area was evaluated. Preliminary mitigation measures for potential impacts on archaeological resources are also provided.

For the purposes of this analysis, the area of investigation within the study area was generally defined as a 100-foot-wide corridor centered on each of the proposed alignments. Exceptions were made in which larger areas were analyzed, for example at proposed station locations and to take into account potential interruption of views from prominent archaeological sites as a result of project construction. At potential station locations, the area of investigation was expanded to include not only the 100-foot-wide corridor of the adjacent alignment, but also the footprint of the station location. Where views from prominent archaeological sites could be compromised by project construction, the investigation area included the footprint of the prominent archaeological site.

The area of investigation includes consideration of overall prehistoric and historic settlement patterns within the study area. These settlement patterns were used to predict areas of potential archaeological resources that might not otherwise be identified on proxy data sets and previous archaeological investigations that were confined to much narrower geographic areas.

Generally, the methods described below were developed as part of another large, linear development project that encompassed vast geographic areas and had the potential to affect archaeological deposits. In 2001, Cultural Surveys Hawai‘i completed an archaeological assessment of approximately 112.6 miles of road corridor on the island of O‘ahu. The road corridors are proposed for the installation of a telecommunications cable system connecting Department of Hawaiian Home Lands properties on O‘ahu. The objective of this assessment was to identify areas within the corridors that have the potential to contain archaeological resources (Hammatt, 2001). The methods for

archaeological resource identification and geographic synthesis using existing archaeological data and proxy historical and environmental data sets proved effective.

During preparation of this report, the following resources were used and activities were employed to identify areas of archaeological concern within the study area. These methods were discussed with the Office of Hawaiian Affairs in late January 2006 and the State Historic Preservation Division in early February 2006. Response to this approach was positive.

- Inspection of U.S. Department of Agriculture (USDA) soil survey data (Foote, et al., 1972) for the study area to identify soil types under or immediately adjacent to the area of investigation that, based on past experience, are more likely to contain archaeological deposits. For example, *Fill Land* in coastal regions is often associated with former Native Hawaiian fishponds, and Jaucas sand deposits are often associated with traditional Hawaiian burials.
- Inspection of tax maps and historic maps showing presence of Land Commission Award (LCA) parcels within or adjacent to the study area. The Organic Acts of 1845 and 1846 initiated the process of the *Mahele* — the division of Hawaiian lands — which introduced private property into Hawaiian society. In 1848, the crown, the Hawaiian government, and the *ali'i* (royalty) received their land titles. *Kuleana* awards for individual parcels within the *ahupua'a* were subsequently granted in 1850. These LCAs were presented to tenants — native Hawaiians, naturalized foreigners, non-Hawaiians born on the islands, or long-term resident foreigners — who could prove occupancy on the parcels before 1845. Maps and other documents associated with these awards may provide clues to settlement and other activities within and nearby the study route in the mid-1850s. LCA data are commonly used by archaeologists as indicators of past land use that may not be readily apparent on the current land surface.
- Review of Geographic Information System (GIS) data and archaeological reports at SHPD. The GIS data and archaeological reports provide specific information on the location and distribution of previously recorded surface and subsurface archaeological sites within or near the study area. Additionally, archaeological reports may contain results of subsurface testing near the study area.
- Inspection of historic maps and early land survey maps to locate areas of potential archaeological concern.
- Field observations of portions of the study area to evaluate the relationship of the study area to possible surface and subsurface archaeological resources.
- Consultation with SHPD to make use of its resources and expertise. However, all evaluations and findings in this report are those of Cultural Surveys Hawai'i and should not be interpreted as reflecting those of the SHPD.

Draft EIS Phase Methodology

The draft EIS will build upon information from the AA. It will further analyze and refine the available background research that is pertinent to the LPA and include an archaeological inventory-level investigation to support the project's Section 106 historic property (archaeological resources) identification efforts. Methods specific to the LPA

will be described, as will methods used to evaluate the eligibility of identified archaeological resources' to the National Register. It will also provide more specific guidance regarding potential impacts and mitigation for archaeological resources affected by the LPA.

The following methods will be used for this analysis:

- Intensive field inspection of the entire LPA
- More in-depth background research, including historic maps, LCA records, soil survey data, past archaeological investigation reports, and querying of the SHPD archaeological database and GIS system
- Consultation with SHPD
- Consideration of the appropriate methods for archaeological resource identification and documentation.
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Chapter 3 Methodology References

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The following discussion of the affected environment for archaeological resources is based on research completed to date for the Alternatives Assessment, as described in Chapter 3. This preliminary information is supplemented by maps with various proxy data sets (e.g., historic maps, Land Court Award records, USDA soils survey data), as described in Chapter 3, which provide additional information regarding potential archaeological resources within the study area.

During preparation of this affected environment section, SHPD's historic property GIS database was not available for use. This GIS database contains geographic location and basic descriptive information for most prior archaeological investigations and previously recorded archaeological sites throughout the state. As such, it was necessary to examine SHPD's archaeological reference list to find archaeological reports and sites that pertain to the study area.

Alternative 3: Managed Lane

The Managed Lane Alternative may result in fewer impacts on cultural resources and burials than the Fixed Guideway Alternative. In general, the Managed Lane Alternative would traverse the same alignments discussed in detail for Alternative 4 below. Figures 4-1 and 4-2 show the number and boundaries of these TMK plats that correspond to the archaeological study corridor for each of the five sections associated with Alternative 3. Any associated ground disturbance would result in the same likelihood of encountering cultural resources and burials.

'Ewa Section

One new alignment associated with the 'Ewa Section involves the Waikele Spur, which would connect to central O'ahu. Prior archaeological research pertinent to this section is summarized in Table 4-1. If developed in proximity to the H-2 alignment, the probability of encountering cultural resources and burials appears to be low.

Table 4-1. Alternative 3 Managed Lane ('Ewa Section) Waikele Spur Previous Archaeological Studies

Author	Nature of Study	TMK [1] --	Location
Barrera, 1985a	Reconnaissance Survey	9-4-007:001	Kilohana, Waipi'o Ahupua'a
Barrera, 1985b	Reconnaissance Survey	9-4-07:012, 9-4-07:013	Waikele Ahupua'a
Dixon, 1993	Reconnaissance Survey	2-9-036, 3-7-004, 4-1-011, 4-5-041, 9-4-007	Five Water Supply Wells, one in Waipi'o Ahupua'a

Koko Head Section

A new alignment associated with the Nimitz Section departs significantly from the Alternative 4 alignments. Archaeological research pertinent to this section is summarized in Table 4-2. In some places, this section appears to traverse coastal lands that may have

been heavily used in the past, while other stretches traverse areas that were almost certainly shallow seas and thus may lack significant cultural deposits.

Table 4-2. Alternative 3 Managed Lane (Koko Head Section) Previous Archaeological Studies

Author	Nature of Study	TMK [1] -	Location
Chiogioji and Hammatt, 1995	Assessment	1-5-020, 1-5-034, 1-5-041, 1-5-042	Hart Street Pump
Hammatt, 1986	Reconnaissance Survey	1-2-024, 1-2-036, 1-2-037	Sand Island Post Office
Kawachi, 1989	Burial Report	1-5-012:005	Iwilei Road
Kennedy and Moore, 1999	Burial Report	1-5-032:002	Pier 40, Honolulu Harbor
Moore, 1997	Burial Report	1-5-032:002	Pier 40, Honolulu Harbor
Nakamura, et al., 1994	Assessment	1-6-003:042, 1-6-003:043, 1-6-003:044, 1-6-003:045, 1-6-003:046, 1-6-003:051, 1-6-003:052, 1-6-003:053, 1-6-003:079, 1-6-003:080, 1-6-003:081, 1-6-003:087, 1-6-003:089	Kapālama-King Streets
Sprinkle, 1996	Cultural Resource Investigation	1-1-003, 1-1-004, 2-1-015	Proposed Honolulu Detention Center

Alternative 3 Managed Lane References

Barrera, William, Jr., 1985a. Memo--*Archaeological Reconnaissance of Kilohana, 'Ewa, O'ahu, 1-9-4-007:001*. Chiniago, Honolulu.

Barrera, William, 1985b. *Waikale, O'ahu: Archaeological Reconnaissance, TMK 1-9-4-07:12, 13*. Chiniago, Honolulu.

Dixon, Boyd, 1993. *An Archaeological Reconnaissance of Five Board of Water Supply Wells on O'ahu, Hawai'i, 1-9-4-007; 1-2-9-036; 1-3-7-004; 1-4-1-011; 1-4-5-041*. Department of Anthropology, Bernice P. Bishop Museum, Honolulu.

Chiogioji, Rodney, and Hallett H. Hammatt, 1995. *An Archaeological Assessment of the Hart Street Wastewater Pump Station Force Main Replacement Project at Honolulu Harbor and Sand Island, Island of O'ahu, TMK 1-1-5-020; -034; -041; -042*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Hammatt, Hallett H., 1986. *Archaeological Reconnaissance of TMK 1-2-24: Por. 36, Por. 37, Parcels on Sand Island Proposed for U.S. Postal Service Use, TMK 1-1-2-024:036, 037*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Kawachi, Carol, 1989. *Iwilei Road Burial Removal, 650 Iwilei Road, Nu'uamu, Honolulu, O'ahu, TMK 1-1-5-012:005*. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawai'i.

Kennedy, Joseph, and James R. Moore, 1999. *The Archaeological Treatment of the Inadvertent Discovery of a Human Burial at Pier 40, TMK: 1-5-32:2, Kapālama Ahupua'a, Kona District, Island of O'ahu, TMK 1-1-5-032:002*. Archaeological Consultants of the Pacific, Hale'iwa, Hawai'i.

Moore, James R., 1997. *Inadvertent Burial Discovered at Pier 40 in Kapālama, Ahupua'a, Kona District, O'ahu, TMK 1-1-5-032:005*. Archaeological Consultants of the Pacific, Hale'iwa, Hawai'i.

Nakamura, Barry, Jeffrey Pantaleo, and Aki Sinoto, 1994. *An Archaeological Assessment of a Parcel of Land in Kapālama on the Corner of North King and Houghtaling Streets, Kapālama, Kona District, O'ahu*. Aki Sinoto Consulting, Honolulu.

Sprinkle, John H., 1996. *Cultural Resource Investigation Honolulu, Hawai'i Proposed Detention Facility, TMK 1-1-1-003; -004; 1-2-1-015*. Louis Berger & Associates, Honolulu.

Alternative 4: Fixed Guideway

The following is a discussion of the previous archaeological sites and prior archaeological investigations within the Tax Map Key (TMK) plats through which the study area passes. Figures 4-3 through 4-7 show the number and boundaries of these TMK plats that correspond to the archaeological study corridor for each of the five sections associated with Alternative 4. Using the TMK plat as the unit of search yielded some results that were not directly pertinent to the study area, but it also ensured that important archaeological information was not overlooked. Approximately 575 prior archaeological investigations for these TMK were identified. Some of these were easily removed from analysis based on their distance from the study area, which was done for the shorter bibliography presented in Chapter 5, Impacts.

For Alternative 4, the discussion proceeds from 'Ewa to Koko Head and is generally presented by alignment within each section. Where multiple alignments converge, these areas are discussed together as nodes. Information is primarily presented in table form, with associated summary text, followed by complete bibliographic information for each study at the end of Chapter 4.

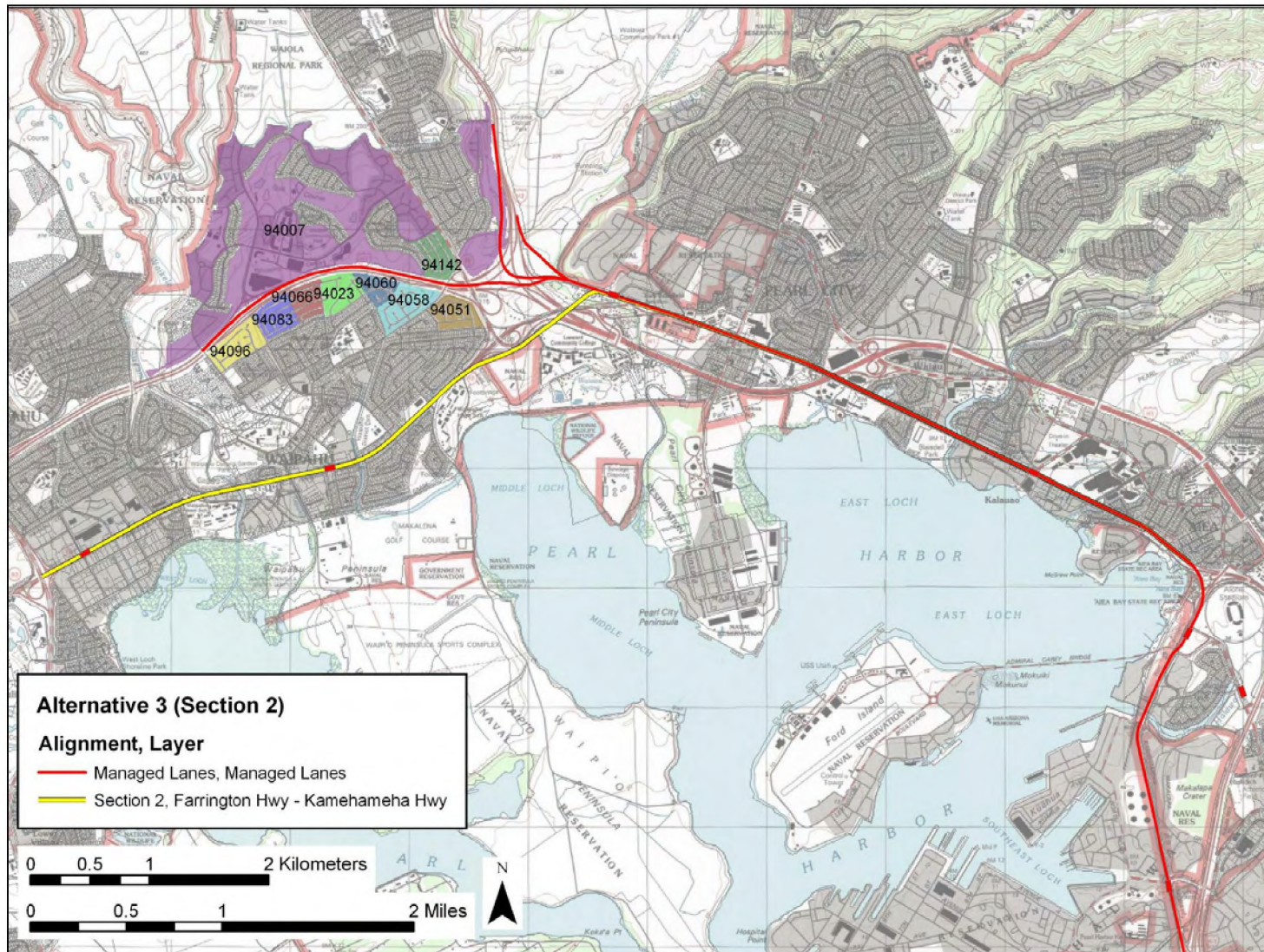


Figure 4-1. TMK plats with prior archaeological documentation, Alternative 3, 'Ewa Section

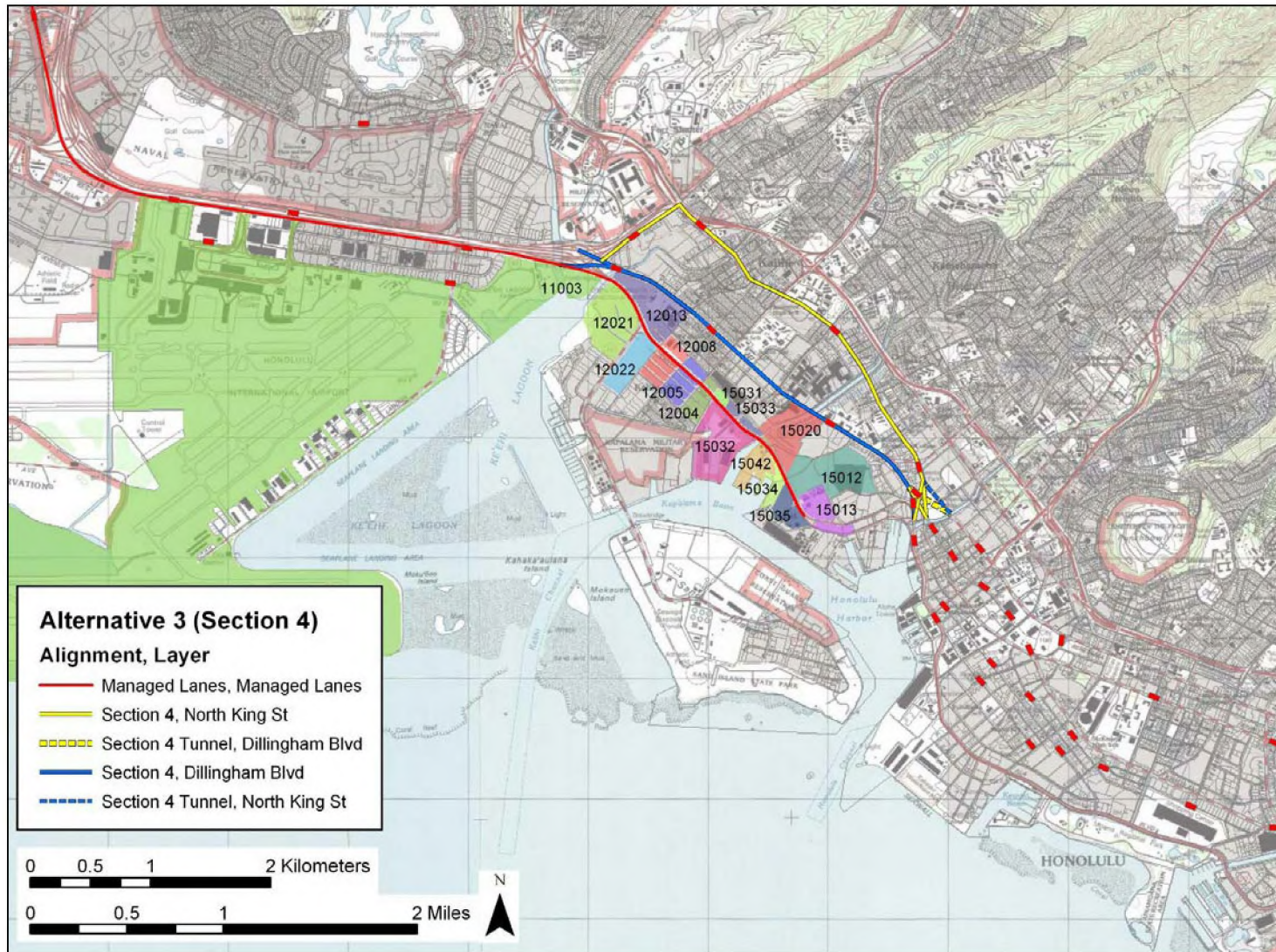


Figure 4-2. TMK plats with prior archaeological documentation, Alternative 3, Koko Head Section

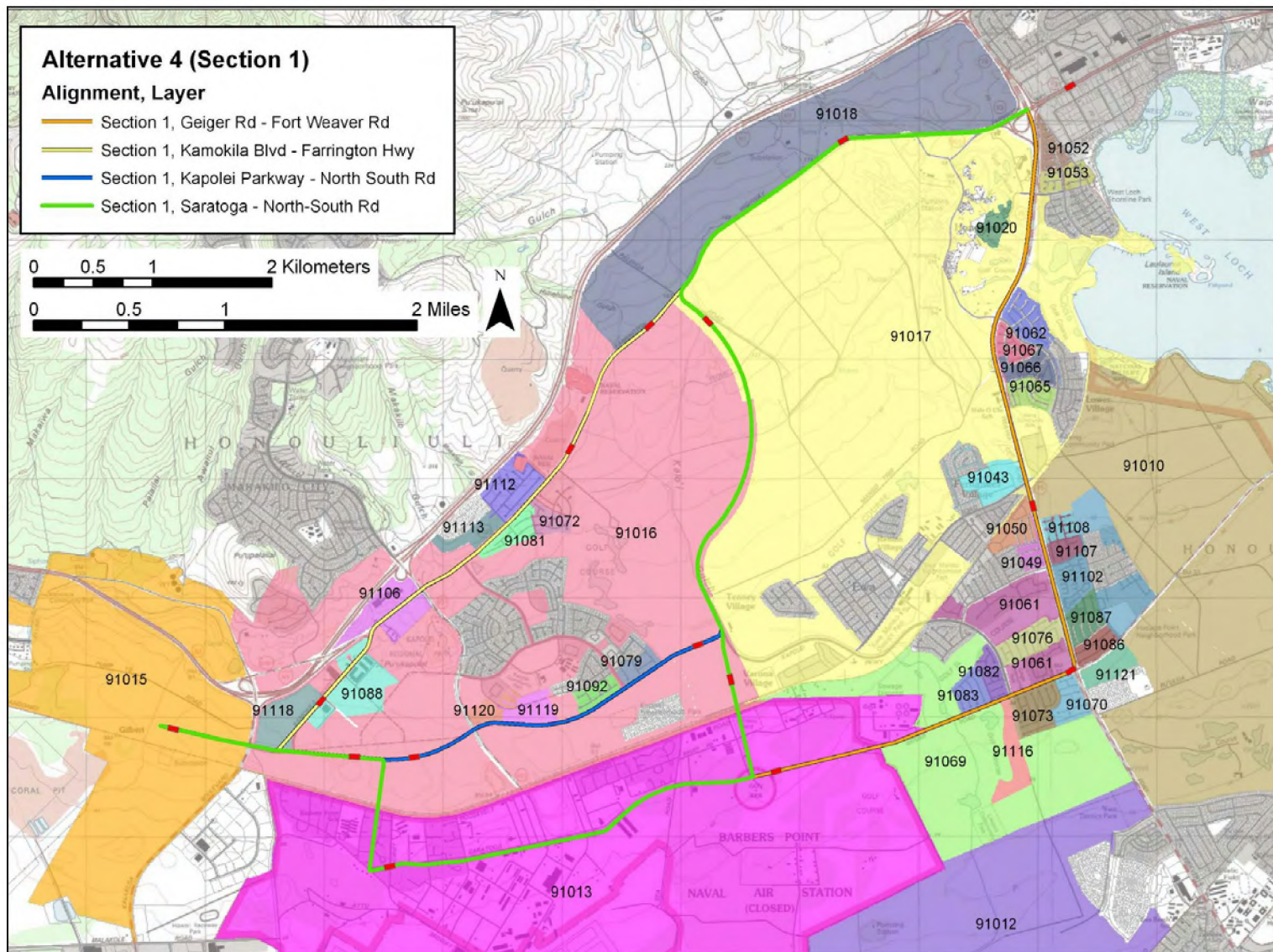


Figure 4-3. TMK plats with prior archaeological documentation, Alternative 4, Section I

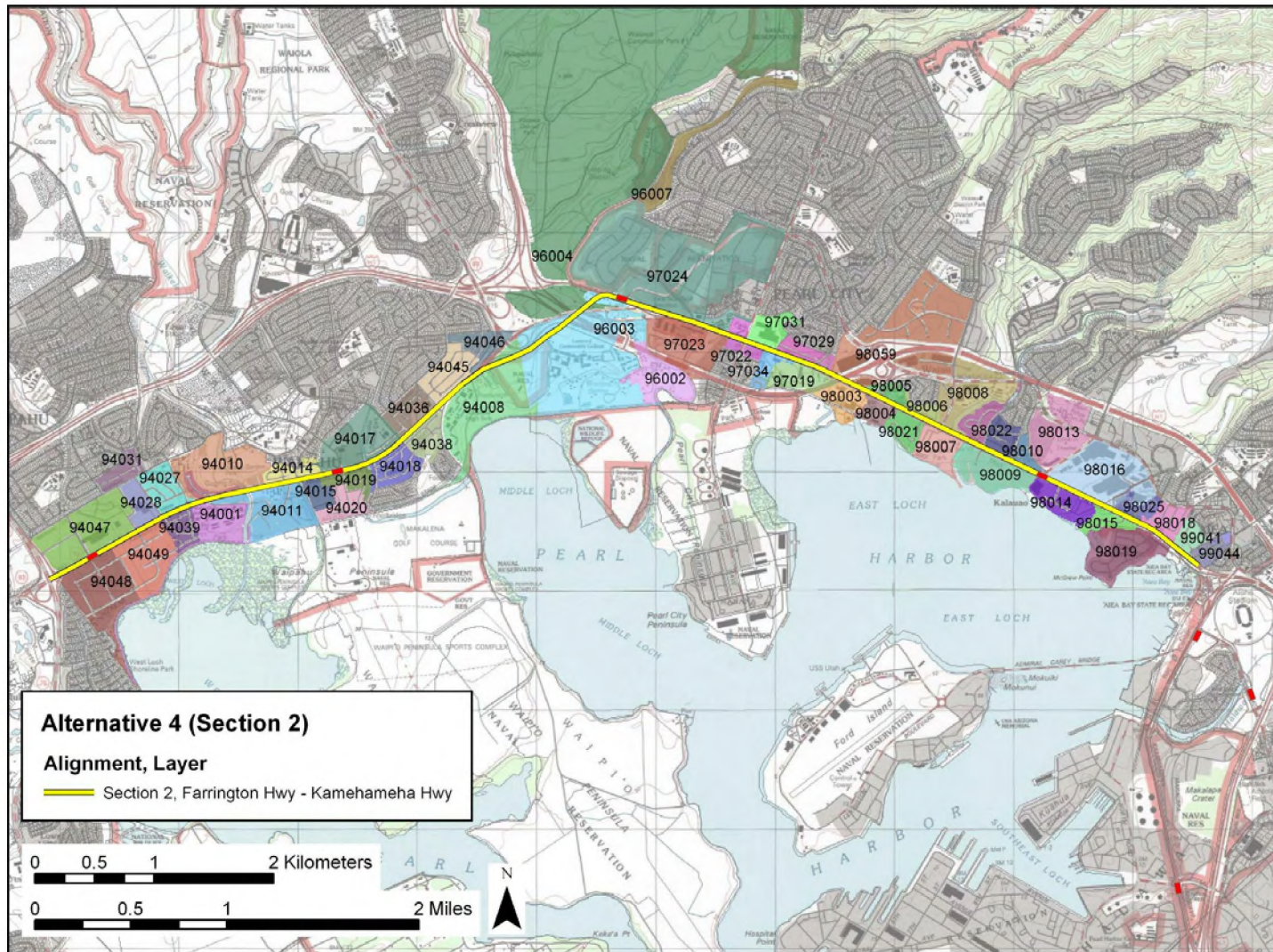


Figure 4-4. TMK plats with prior archaeological documentation, Alternative 4, Section II

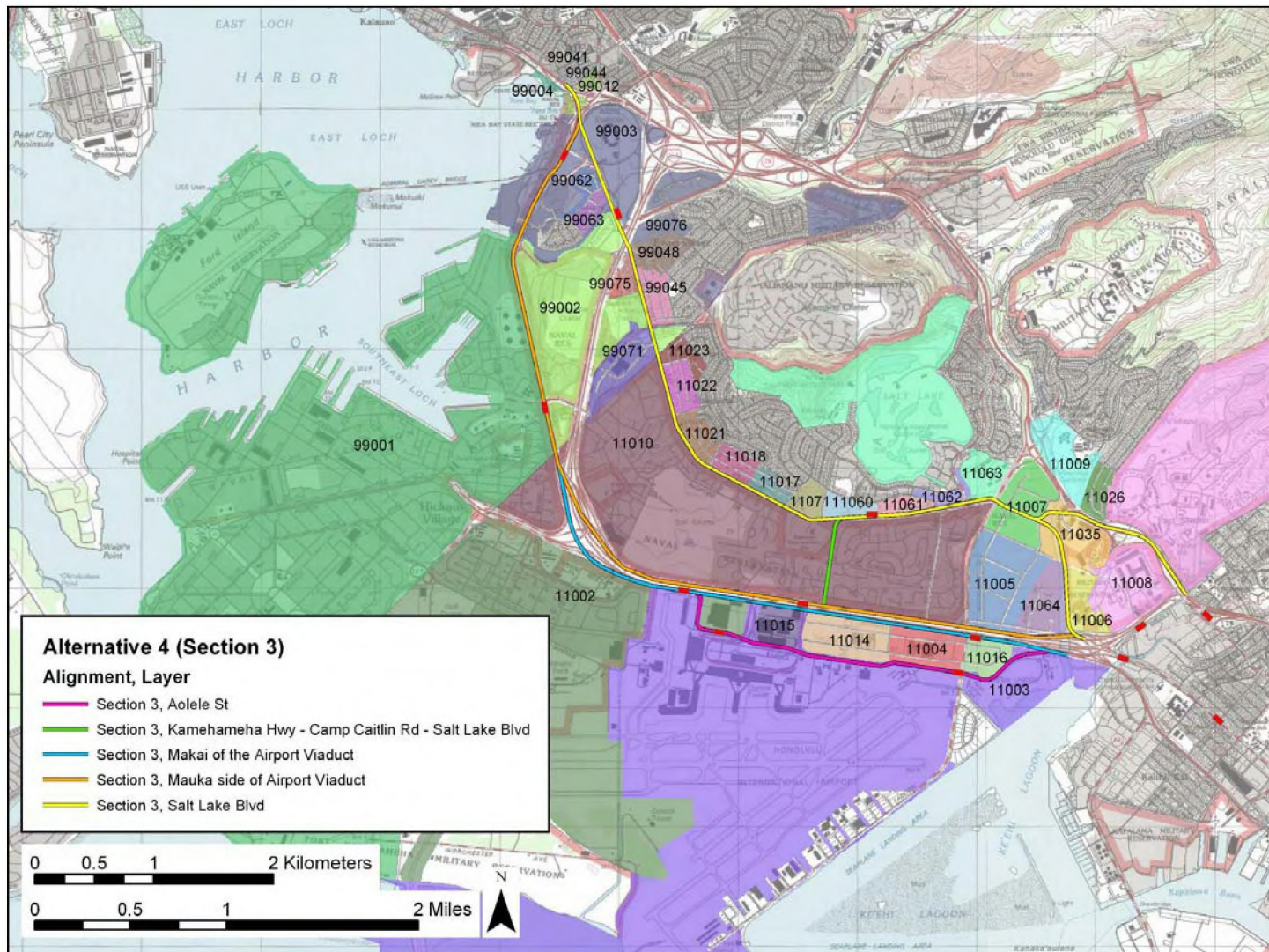


Figure 4-5. TMK plats with prior archaeological documentation, Alternative 4, Section III

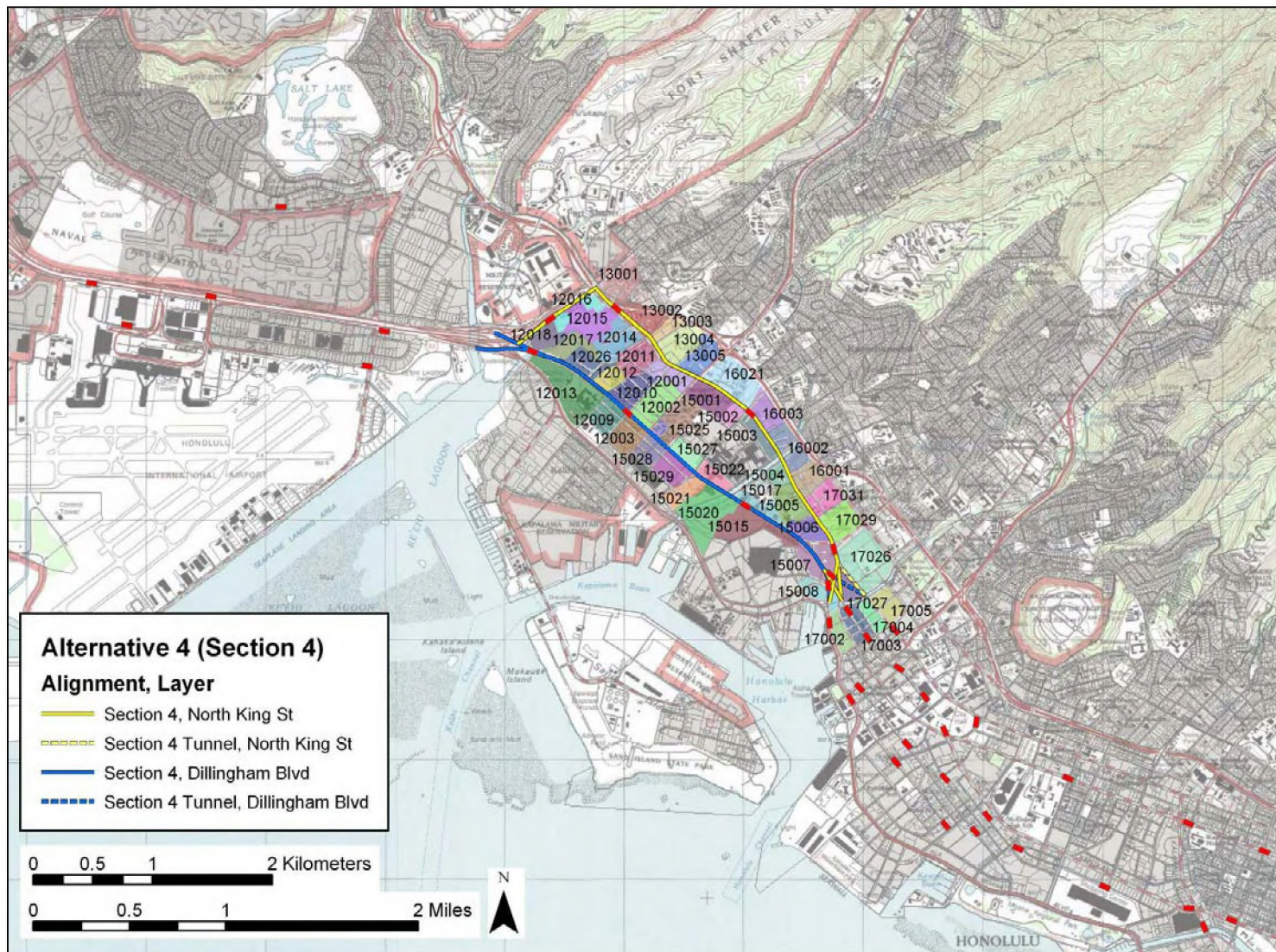


Figure 4-6. TMK plats with prior archaeological documentation, Alternative 4, Section IV

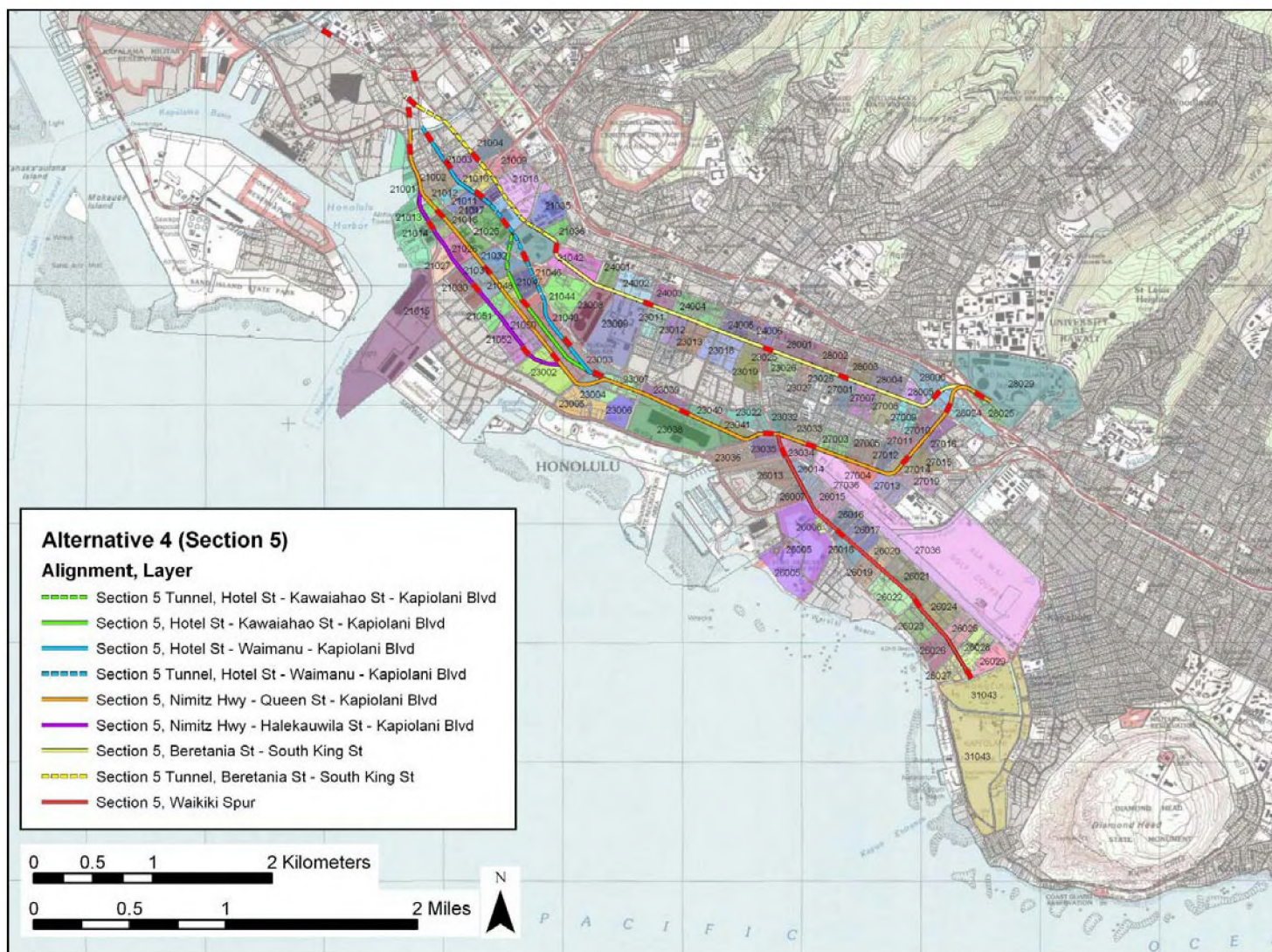


Figure 4-7. TMK plats with prior archaeological documentation, Alternative 4, Section V

Section I – Kapolei to Fort Weaver Road

Figure 4-8 shows pertinent prior archaeological investigations, discussed in the text and tables below, within Section I (Kapolei).

Kamōkila Boulevard/Farrington Highway

Kamōkila Boulevard

The Haun, 1986a 1,400-acre study and the Rosendahl, 1987a (Kapolei Village Master Plan) studies covered the western portion of the Kamōkila Boulevard alignment west of the junction with Farrington Highway. These two studies also covered the south side of Kamōkila Boulevard from the junction with Farrington Highway east to Fort Barrette Road. There were no significant finds reported in this area. A wedge of land on the north side of Kamōkila Boulevard (location of the present Kapolei Shopping Center) appears to have never been formally covered in an archaeological study. There is no information regarding archaeological finds during construction of the shopping center. More recent archaeological studies in the western ‘Ewa Plain have resulted in few or no significant finds.

Farrington Highway

Most of the central portion of the Kamōkila Boulevard/Farrington Highway alignment east of Fort Barrette Road was covered by Rosendahl, 1990 (Kapolei Golf Community Addition) on the *makai* side and by Haun, 1986a and O’Hare, et al., 2005a on the *mauka* side. The only noted archaeological resources consisted of plantation infrastructure.

Lands adjacent to the east portion of the Kamōkila Boulevard/Farrington Highway alignment were addressed in the Dicks, et al., 1987 and O’Hare, et al., 2006a studies. The Dicks, et al., 1987 study identified a habitation deposit (site 50-80-12-3321) near Farrington Highway that merits further consideration. The O’Hare, et al., 2006a study identified certain plantation infrastructure (Site 50-80-12-4344 features D to G) near Farrington Highway, but no further work was recommended for these twentieth century features.

The likelihood for human burials or other archaeological and cultural properties on the Kamōkila Boulevard/Farrington Highway alignment is regarded as low, with the possible exception of the approximately 4,000 feet at the extreme east end near the intersection with Fort Weaver Road that merits more detailed study.

Kapolei Parkway/North-South Road

Kapolei Parkway

The Haun, 1986a 1,400-acre study, the Rosendahl, 1987a (Kapolei Village Master Plan), and the Rosendahl, 1990 (Kapolei Golf Community Addition) studies covered approximately the western 85 percent of the Kapolei Parkway alignment. No archaeological sites were noted in the immediate vicinity of the Parkway. The likelihood for human burials and other archaeological or cultural properties on the Kapolei Parkway alignment is regarded as low.

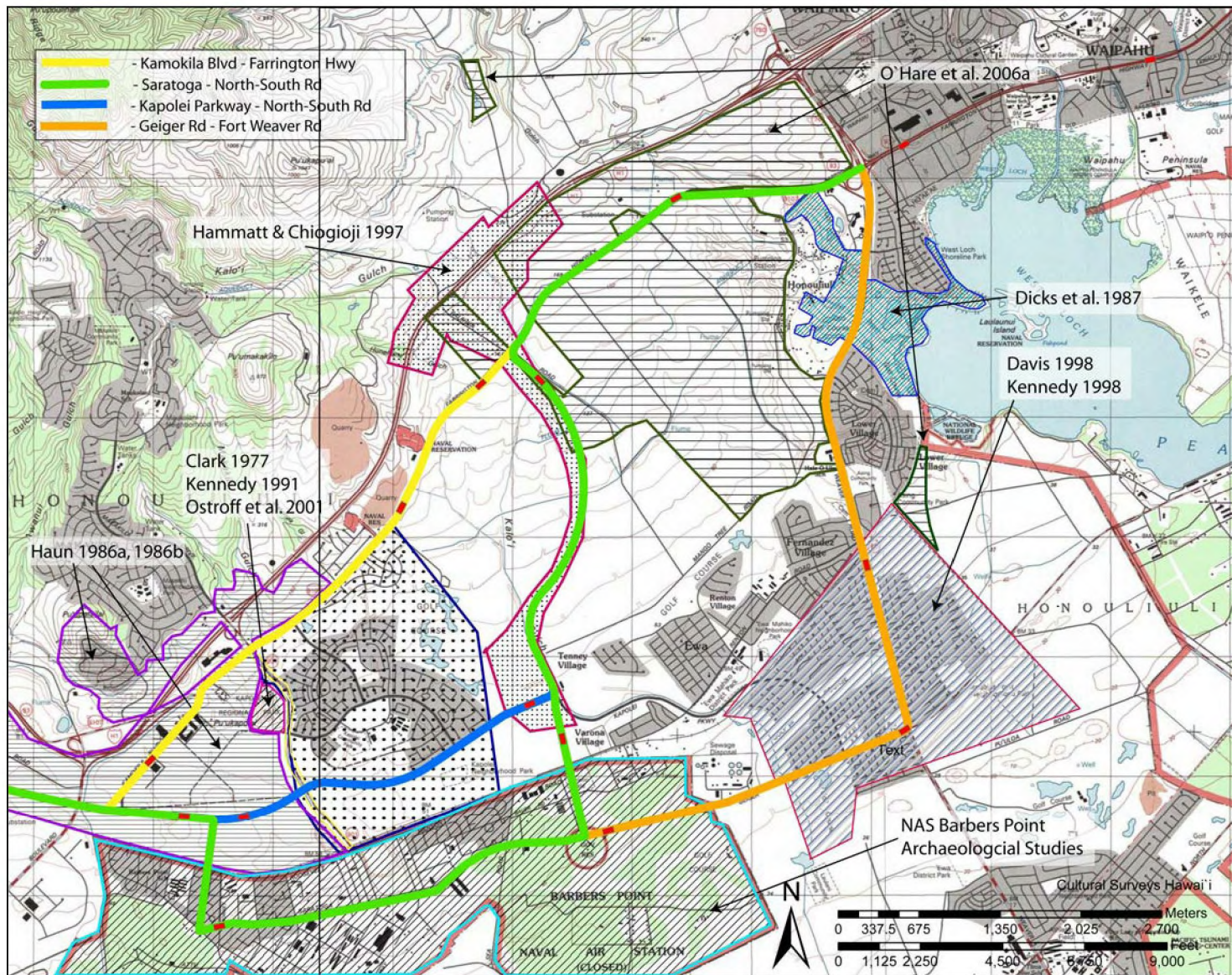


Figure 4-8. Pertinent prior archaeological investigations for Section I

North-South Road

Reconnaissance survey studies (Hammatt and Chiogioji, 1997; Chiogioji and Hammatt, 1997) were carried out for two slightly different alignments of the (then proposed) North-South Road corridor. The Chiogioji and Hammatt, 1997 study corresponds to that road alignment segment under consideration for the Honolulu High-Capacity Transit Corridor Project. The Hammatt and Chiogioji, 1997b study reviewed previous archaeological work (up to 1997) in the vicinity (including McAllister, 1933; Rosendahl, 1987b; Kennedy, 1988; Davis, 1988; Hammatt, et al., 1990) and also included a field inspection. No traditional Hawaiian sites were noted in the vicinity from either the previous archaeological studies or in the project-specific fieldwork. The Chiogioji and Hammatt, 1997 study notes the presence of plantation constructions (remnants of flumes, a ditch, and roadways) in the vicinity, but these were not classified as sites at that time. The proximity of the 'Ewa Villages Historic District (Site 50-80-12-9786) and the O.R.&L. right-of way (Site 50-80-12-9714; listed on the National Register of Historic Places) were noted, but these are not immediately adjacent to the road alignment segment under consideration for this project. The authors of this study concluded: "no further archaeological investigation is recommended for the entire [North-South Road] project area corridor and on-site or on-call monitoring is not justified during future construction activities" (Chiogioji and Hammatt, 1997: 22).

Despite the recommendation, the Department of Transportation initiated an archaeological monitoring program during construction of the North-South Road project. On-going archaeological monitoring of this construction through a combination of on-site and on-call archaeological monitoring continues (as of March 2006). No archaeological finds have been made to date.

Further documentation of plantation infrastructure that may be affected by project construction might be appropriate. It appears there have been no other archaeological or cultural properties identified in this corridor. The likelihood for human burials or other archaeological and cultural properties on the North-South Road alignment is low.

Saratoga Avenue/North-South Road

Saratoga Avenue

The Saratoga Avenue alignment runs through the much studied Barbers Point Naval Air Station lands (Tuggle, 1994; Welch, 1987; Haun, 1991; Burgett and Rosendahl, 1992; Landrum, 1992; Tuggle and Tomonari-Tuggle, 1997; Tuggle, 1997, and others). Preliminary analysis indicates a number of sites in the vicinity of Saratoga Road. Identified sites believed to lie within one-half mile of Saratoga Road are listed in Table 4-3.

Table 4-3. Known Cultural Resources NAS Barbers Point near Saratoga Avenue Alignment (from Kaneshiro and Schilz, 1994)

Site #	Site Type	Comments
50-80-12-		
1718	Habitation Complex	Six features, pre-contact
1719	Habitation Complex	Nine features, pre-contact
1720	Habitation/Agricultural	Four features, pre-contact

Site # 50-80-12-	Site Type	Comments
1721	Habitation Complex	Five features, pre-contact
1722	Habitation Complex	10 features, pre-contact
1723	Habitation Complex	Eight features, pre-contact
1724	Habitation/Agricultural	Seven features, pre-contact
1725	Habitation Complex	20 features, pre-contact
1726	Platform, cairn, wall	Three features, pre-contact
1727	Cave and sinkhole	Two features, pre-contact, also shell midden and historic artifacts
1729	Sinkhole	One feature, pre-contact "currently used as a dump"
3721	Habitation Complex	Five features, pre-contact
3722	Boundary wall	One post-contact sisal plantation wall
4649	Wall	One feature dating to 1898-1930
4650	Habitation Complex	Five features, pre-contact
4651	Site Complex	Two features (terrace, mound), pre-contact
4652	Mounds	Three features, time frame unknown
4653	Wall	One feature, post-contact

In general, on the 'Ewa plain the likelihood of encountering cultural resources or burials increases the closer one is to the coast. Preliminary investigations indicate the Saratoga Avenue alignment may have a higher likelihood of encountering cultural resources or burials than the more *mauka* alignments. This likelihood, however, may still be low. Further analysis of archaeological studies of the former Naval Air Station (NAS) will clarify the likelihood, density, and distribution of finds.

North-South Road

Please see "North-South Road" discussion above under "Kapolei Parkway-North-South Road" above.

Geiger Road/Fort Weaver Road

Geiger Road

The western third of the Geiger Road portion of the Geiger Road/Fort Weaver Road alignment (one-third of the way east from North-South Road toward Fort Weaver Road) lies within the much studied Barbers Point Naval Air Station (NAS). Sites 50-80-12-3721 and 50-80-12-3722 (see Table 4-3 above) lie approximately one-quarter mile south of the North-South Road/Geiger Road intersection. The eastern third of the Geiger Road section (and the southern third of the Fort Weaver Road section) lie in the 'Ewa Gentry project lands (Davis, 1988, Kennedy, 1988). No archaeological sites were identified in the vicinity of Geiger Road in these studies.

Similar to Saratoga Avenue, the Geiger Road alignment may have a higher likelihood of encountering cultural resources and burials than the more *mauka* alignments. This likelihood, however, may still be low. Further analysis of archaeological studies on the former Naval Air Station will clarify the likelihood, density, and distribution of finds.

Fort Weaver Road

The southern third of the Fort Weaver Road alignment lies in the ‘Ewa Gentry project lands (Davis, 1988; Kennedy, 1988). Just northeast of where Fort Weaver Road intersects the O.R.&L. alignment, excavations have yielded what appears to be a weakly expressed cultural layer that has been designated site 50-80-12-5334.

At its northern end, the Fort Weaver Road alignment passes through the Dicks, et al., 1987 project lands. Sites noted in this study as lying near Fort Weaver Road include site 50-80-12-3316 (an historic cemetery), and sites 50-80-12-3315 and 50-80-12-3317 (both described as surface artifact collection areas). The study’s findings merit further study, as they may provide insight into the potential cultural resources in the area where the Fort Weaver Road alignment skirts the edge of Pearl Harbor.

The northern portion of Fort Weaver Road in proximity to West Loch and the natural resources of Pearl Harbor merits particular attention as part of a more detailed investigation.

Summary of Geiger Road/Fort Weaver Road Alignment

In summary, the western portion of the Geiger Road/Fort Weaver Road alignment extends through: the Barbers Point Naval Station area, at which modified sinks and pre-contact habitation sites have been recorded, and the northern section extends through a portion of the “West Loch” project area, at which pre-contact artifact scatters and post-contact cemeteries have been recorded. In light of these archaeological properties, this alignment has a “medium” potential impact for pre-contact archaeology. Pertinent references for this alignment are presented in Table 4.4.

Table 4-4. Section 1 (Kapolei to Fort Weaver Road) Previous Archaeological Studies

Author	Nature of Study	TMK [1] -	Location
Ahlo and Hommon, 1980	Reconnaissance Survey	9-1-	Solid Water Processing Plant, Hono‘uli‘uli
Apple and Kikuchi, 1975	Fishpond Survey	Various	Island-wide
Athens, et al., 1997a	Cultural Resource Inventory	Various	‘Ewa Plain
Barrera, 1979a	Reconnaissance Survey	9-	Honolulu Water Energy Proposed Site
Barrera, 1986	Archaeological Investigation	9-1-015:003, 9-1-015:004, 9-1-015:007	West Beach
Bath, 1989	Burial Report	9-1-017:023	Hō‘a‘eae Point, West Loch
Bowen and Soehren, 1962	Burial Report	9-1-013	Barbers Point NAS
Burgett and Rosendahl, 1992	Inventory Survey	9-1-013	Barbers Point NAS
Chiogioji and Hammatt, 1997	Reconnaissance Survey	9-1-017:004, 9-1-018:001	4.5 kilometer corridor in Hono‘uli‘uli
Clark, 1977	Reconnaissance Survey	9-1-016:002	Pu‘uokapolei

Author	Nature of Study	TMK [1] -	Location
Clark and Connolly, 1975	Reconnaissance Survey	9-1-012	Hono'uli'uli Sewage Treatment Plant
Cleghorn and McIntosh, 2003	Reconnaissance Survey	9-1-010:007, 9-1-069:005	'Ewa Gentry
Davis, 1988	Subsurface Survey	9-1-012:001, 9-1-012:007, 9-1-019:002, 9-1-019:006	'Ewa Gentry
Davis, 1990a	PhD Dissertation	Various	'Ewa Plain
Dicks, et al., 1987	Reconnaissance Survey	9-1-017:001, 9-1-017:006, 9-1-017:013, 9-1-017:014, 9-1-017:015, 9-1-017:018, 9-1-017:025, 9-1-017:041	West Loch Estates
Frierson, 1972	College Paper	Various	Hono'uli'uli
Goodfellow, et al., 1998	Data Recovery	9-1-017:	West Loch Estates
Goodman and Cleghorn, 1991	Literature Search	9-1-010:007, 9-1-012:005	Laulani Housing Project, Pu'uloa
Hammatt, 1991	Reconnaissance Survey	Various	Hono'uli'uli Livestock Park
Hammatt and Chiogioji, 1997	Reconnaissance Survey	Various	29,100 foot corridor in Hono'uli'uli
Hammatt and Shideler, 1990	Inventory Survey	9-1-017:004	West Loch Bluffs
Hammatt and Shideler, 1999	Assessment	9-1-017:060	Saint Francis Medical Center - West
Hammatt and Shideler, 2003	Status Clarification	9-1-015:004, 9-1-015:018	Kapolei
Hammatt, et al., 1990	Reconnaissance Survey	Various	'Ewa Villages
Haun, 1986a	Reconnaissance Survey	9-1-015:005, 9-1-015:017, 9-1-016:006, 9-1-016:030	'Ewa Town Center
Haun, 1986b	Reconnaissance Survey	9-1-015:005, 9-1-015:017, 9-1-016:006, 9-1-016:030	'Ewa Town Center
Haun 1991	Inventory Survey	9-1-013	Barbers Point NAS
Hommon, et al., 1973	Inventory Survey	Various	Hono'uli'uli
Jayatilaka, et al., 1992	Inventory Survey	9-1-010	Proposed Hawai'i Prince Golf Course
Jensen, and Bouthillier, 1998	Cultural Resources Management Plan	Various	Naval Magazine Lualualei
Jensen, et al., 1988	Mitigation Plan	9-1-017:009, 9-1-017:010, 9-1-017:013, 9-1-017:014, 9-1-017:018 to 9-1-017:033, 9-1-017:041	West Loch Estates
Kaneshiro and Schilz, 1994	Literature Search	9-1-013	Barbers Point NAS
Kennedy, 1988	Reconnaissance Survey	9-1-010:002, 9-1-010:007, 9-1-012:001, 9-1-012:029	'Ewa Gentry
Kennedy, 1991a	Subsurface Testing	9-1-016:002	Fort Barrette/Kapolei

Author	Nature of Study	TMK [1] -	Location
Landrum, 1992	Reconnaissance Survey	9-1-013	Barbers Point NAS
Landrum and Schilz, 1993	Reconnaissance Survey	9-1-013	Barbers Point NAS
Landrum and Schilz, 1996	Monitoring Report	9-1-013	Nimitz Beach, Barbers Point NAS
Magnuson, 1999	Reconnaissance Survey	9-1-000:000	Farrington Highway Expansion
Magnuson and Tomanari-Tuggle, 2002	Assessment	9-1-, 9-3-, 9-4-, 9-6-, 9-8-	Waiau Fuel Pipeline
McDermott and O'Leary, 2006	Literature Search and Field Inspection	9-1-014:027, 9-1-014:034, 9-1-015:001	Proposed West Kalaeloa Industrial Development
McIntosh and Cleghorn, 1999	Literature Search	Various	Hono'uli'uli Wastewater Treatment Plan
Mitchell and Hammatt, 2004	Cultural Impact Assessment	9-1-015:004, 9-1-015:018, 9-1-015:020, 9-1-014:033	Mauka of Barbers Point Barge Harbor
Neller, 1982	Literature Search	9-1-013	Barbers Point NAS
O'Hare, et al, 1996	Intensive Survey	9-1-013	Barbers Point NAS
O'Hare, et al., 2005a	Archaeological and Cultural Impact Evaluation	9-1-015:004, 9-1-015:017, -9-1-016:006, 9-1-016:024	Proposed Interstate H-1 Improvements, Kapolei
O'Hare, et al., 2006a	Inventory Survey	9-1-010:002, 9-1-017:004, 9-1-017:059, 9-1-017:072, 9-1-018:001, 9-1-018:004, 9-2-001:001	Ho'opili Project, East Kapolei
O'Hare, et al., 2006b	Assessment	9-1-016:001, 9-1-016:012, 9-1-016:032	Kamōkila Boulevard Extension
Pantaleo and Sinoto, 1993	Inventory Survey	9-1-010:015	'Ewa Gentry Drainage
Peterson, et al., 2002	Monitoring Plan	9-1-, 9-3-, 9-4-, 9-6-, 9-7-, 9-8-	Waiau Fuel Pipeline
Rosendahl, 1987a	Reconnaissance Survey	9-1-016:023	Kapolei Village
Rosendahl, 1987b	Reconnaissance Survey	8-9-, 9-1-015:003, 9-1-15:018	Ko Olina Resort
Rosendahl, 1987c	Reconnaissance Survey	9-1-052, 9-1-053, 9-1-054	West Loch Estates
Rosendahl, 1987d	Reconnaissance Survey	9-1-015:005, 9-1-015:017, -1-016:006, 9-1-016:030	'Ewa Town Center
Rosendahl, 1988	Mitigation Program	9-1-052, 9-1-053, 9-1-054	West Loch Estates
Rosendahl, 1990	Reconnaissance Survey	9-1-006:025	Kapolei Golf Course
Rosendahl, 2002	Cultural Impact Assessment	9-1-, 9-3-, 9-4-, 9-6-, 9-8-	Waiau Fuel Pipeline
Sinoto, 1988	Inventory Survey	9-1-010:006, 9-1-010007	'Ewa Golf Course
Sinoto, 1995	Monitoring Plan	9-1-010:015	'Ewa Gentry Drainage

Author	Nature of Study	TMK [1] -	Location
Souza, et al., 2005	Cultural Impact Assessment	9-1-010:004, 9-1-010:014, 9-1-010:015, 9-1-017:012	'Ewa Gentry Drainage
Souza and Hammatt, 2006	Cultural Impact Assessment	9-1-010:002, 9-1-017:004, 9-1-017:059, 9-1-017:072, 9-1-018:001, 9-1-018:004, 9-2-001:001	Ho'opili Project, East Kapolei
Spear, 1996a	Reconnaissance Survey	9-1-016:017	East Kapolei
Spear, 1996b	Cultural Resources Review	9-1-016:017, 9-1-016:025, 9-1-017:004	Kapolei town
Tuggle, 1994	Inventory Survey	9-1-013	Barbers Point NAS
Tuggle and Tomonori-Tuggle, 1997	Literature Search	9-1-013	Barbers Point NAS
Tuggle, et al., 1994	Literature Search	9-1-013	Barbers Point NAS
Tuggle, et al., 1997	Literature Search	9-1-013	Barbers Point NAS
U.S. Dept. Navy, 1978	National Historic Landmark Report	9-1-013	Barbers Point NAS
U.S. Dept. Navy, 1998	Cultural Impact Statement	9-1-013	Barbers Point NAS
Welch, 1987	Reconnaissance Survey	9-1-013	Barbers Point NAS
Welch and Tuggle, 1996	Management Plan	9-1-013	Barbers Point NAS
Wickler, et al., 1996	Cultural Resource Inventory	9-1-013	Barbers Point NAS
Wulzen and Rosendahl, 1995	Assessment	Various	Barbers Point NAS, and Lualualei West Loch
Yoklavich, et al., 1992	Cultural Resources Survey	9-1-013	Barbers Point NAS

Section I – Kapolei to Fort Weaver Road References

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Chiogioji, Rodney, and Hallett H. Hammatt, 1997. *Archaeological Reconnaissance Survey of a 4.5 Kilometer (14,730-FT) Long Land Corridor within Hono‘uli‘uli Ahupua‘a, ‘Ewa District, O‘ahu Island*. Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

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Clark, Steve, and Robert Connolly, 1975. *Archaeological Reconnaissance Survey for Hono‘uli‘uli Sewage Treatment Plant and Barbers Point Outfall*. Kualoa.

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Section II – Fort Weaver Road to Aloha Stadium

Figure 4-5 shows pertinent prior archaeological investigations, discussed in the text and tables below, within Section II – Fort Weaver Road to Aloha Stadium.

Farrington Highway/Kamehameha Highway

Given its length and proximity to the many cultural resources of Pearl Harbor, the Farrington Highway-Kamehameha Highway alignment has had remarkably little archaeological study (studies are summarized in Table 4-5 and in the list of references at the end of this section). The archaeological sites reported are diverse and include petroglyphs, burials, pre-contact cultural layers, fishponds, and plantation infrastructure. Relatively few burials have been reported and these are widely scattered (Bath, 1988; Chafee and Anderson, 1995; Jourdan, 1995a; Ostroff, et al., 2001a; Perzinski, et al., 2004). No clear pattern of traditional Hawaiian burial locations is evident.

A number of studies (Nagaoka and Davis, 1989; Athens, 2000) have emphasized the potential for recovery of paleoenvironmental data along the margins of Pearl Harbor. Paleoenvironmental studies in Section II may be the most illuminating focus for a research design, which may be required by the State Historic Preservation Division, Department of Land and Natural Resources.

Many projects emphasize the extent of agricultural and urban disturbance with several reporting thick fill layers near Pearl Harbor. One aspect of the long residential development of these lands is mention of former plantation camps, old bridges, and dressed basalt wall segments that may be of historic preservation concern.

For the Farrington Highway/Kamehameha Highway alignment previous contract archaeological studies may be of limited use because there are so few that encompass the length of the alignment. Particular emphasis should be placed on mid-nineteenth century land documents and the available literature on the fishponds of Pearl Harbor.

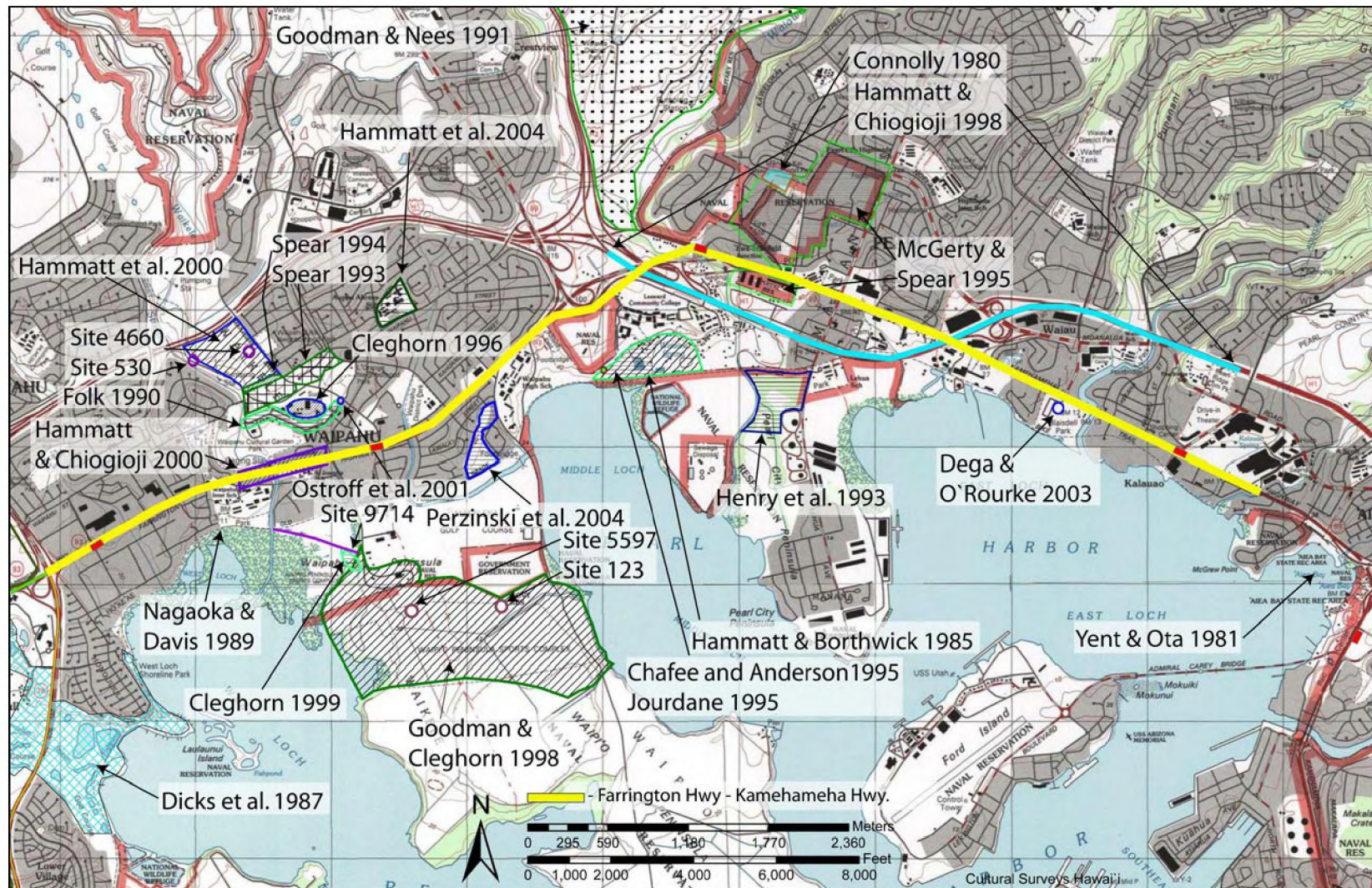


Figure 4-9. Pertinent prior archaeological investigations for Section II

Table 4-5. Section II (Fort Weaver Road to Aloha Stadium) Previous Archaeological Studies

Source	Nature of Study	TMK [1] --	Location
Athens, 2000	Hawaiian Fishpond Study	Various	U.S. Navy Lands Pearl Harbor
Bath, 1988	Burial Report	9-6-002:033, 9-6-002:034	S. Bank of Waiawa Stream, Leeward Community College
Chafee and Anderson, 1995	Burial Report	9-6-003:005	96-035 Waiawa Road (<i>makai</i> of LCC)
Cleghorn, 1996a	Inventory Survey	9-4-002:004	(Old sugar mill lot) Waipahu, Waikele, O'ahu TMK 9-4-2: por. 4
Cleghorn, 1999	Walk Through Survey	9-3-002:000	Proposed 20-inch Irrigation Line for the Waipi'o Peninsula Soccer Park Waikele, Waipi'o Ahupua'a
Connolly, 1980	Reconnaissance Survey	1-1-063:017, 1-1-063:018	Salt Lake District Park
Dega and O'Rourke, 2003	Archaeological Evaluation	9-8-007:020	Blaisdell Park (Waiau Drum Storage Facility), Pearl City
Folk, 1990	Reconnaissance Survey	9-4-	Proposed Waipahu Street Widening Project, Waipahu, Waikele
Goodman and Cleghorn, 1998	Inventory Survey	9-3-002, 9-3-031, 9-3-032, 9-3-033, 9-3-034, 9-4-008, 9-4-010:008, 9-4-010:027, 9-4-010:057, 9-4-011:003, 9-4-011:046, 9-4-011:104	Proposed Waipi'o Sports Complex, Waipi'o Peninsula Waikele and Waipi'o Ahupua'a; 200-acres
Goodman and Nees, 1991	Reconnaissance and Inventory Surveys	9-4-006:011, 9-4-026, 9-6-004:001, 9-6-004:004, 9-6-004:016, 9-6-005:001 to 014	3,600 acres in Waiawa Ahupua'a
Hammatt and Borthwick, 1985	Reconnaissance Survey	9-6-003:025, 9-6-003:026, 9-6-003:027, 9-6-003:028	37-acre wetland parcel, Waiawa, <i>makai</i> of L.C.C.
Hammatt and Chiogioji, 1998a	Assessment	9-4-011	Approximately 7.6 kilometer-long portion of the H-1 from Hālawā to the H-1/H-2 Interchange
Hammatt and Chiogioji, 2000	Assessment	9-4-011	Approximately 2,600-foot portion of Farrington Hwy. Project between 'Anini Place and Waipahu Deport Road, Waikele Ahupua'a
Hammatt, H., et al., 2000	Inventory Survey	9-4-002:005	40-acre parcel along Manager's Drive, Waipahu Waikele Ahupua'a
Hammatt, H., et al., 2004 b	Archaeological and Cultural Assessment	9-4-009, 9-4-059:072, 9-4-059:073, 9-4-059:074	Waipahu Street Drainage Improvements Project, Waipahu
Hammatt, J., et al., 2000	Assessment	9-6-003	Leeward Bike Path, Waiawa Ahupua'a (<i>makai</i> of LCC)
Henry, et al., 1993	Inventory Survey	9-7-016:001	Waiawa Floodplain Feasibility Study Project Area, Land of Mānana 23 acres
Jourdane, 1995a	Burial Report	9-6-003:005	Waiawa Road, Waiawa (<i>makai</i> of LCC)
Kennedy, 1990	Field Surveys	9-7-, 9-8-, 9-9-	Waiau-Makalapa No. 2 138kV Transmission Line

Source	Nature of Study	TMK [1] --	Location
Magnuson and Tomonari-Tuggle, 2002	Historical and Archaeological Assessment	9-1-, 9-3-, 9-4-, 9-6-, 9-8-	Proposed Waiau Fuel Pipeline
McGerty and Spear, 1995	Assessment	9-7-023:001, 9-7-024:006	Mānana and Pearl City Junction
Nagaoka and Davis, 1989	Subsurface Survey and Monitoring	9-4-001:029	Proposed Pupu'ole Park, Waipahu
Ostroff, et al., 2001a	Burial Report	9-4-161:001	Filipino Community Center at in Waikele Ahupua'a
Perzinski, et al., 2004	Inventory Survey	9-4-038:083, 9-4-050:059	13.2-acre Queen Emma Foundation Parcel Waipi'o Peninsula, Waipi'o Ahupua'a
Pietrusewsky and Mahoney, 1988	Burial Report	9-6-002:033, 9-6-002:034	Leeward Community College (Bath described site)
Sinoto, 1986	Archaeological Surface Survey	9-8-014:003, 9-8-014:006, 9-8-014:007, 9-8-015:044, 9-8-015:045	Proposed Pearl Promenade, Kalauao
Sinoto, 1989	Cultural Resources Reassessment	9-8-014, 9-8-015:057, 9-8-015:058, 9-8-019:003, 9-9-001:008, 9-9-001:015, 9-9-001:016, 9-9-003:032	Ford Island Causeway Study
Sinoto and Nakamura, 1984	Cultural Resources Assessment	9-8-014, 9-8-015:057, 9-8-015:058, 9-8-019:003, 9-9-001:008, 9-9-001:015, 9-9-001:016, 9-9-003:032	Proposed Ford Island Causeway Pearl Harbor
Spear, 1993	Reconnaissance Survey	9-4-002:004	The O'ahu Sugar Mill Project Waipahu
Spear, 1994	Reconnaissance Survey	9-4-002:004	Waikele Industrial Subdivision Waipahu
Yent and Ota, 1981	Reconnaissance Survey	9-8-, 9-9-	Proposed Rainbow Bay State Park

Section II – Fort Weaver Road to Aloha Stadium References

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Section III – Aloha Stadium to Middle Street

Figure 4-10 shows pertinent prior archaeological investigations in this section, which are discussed in the following text and tables.

Salt Lake Boulevard

Few archaeological studies have been conducted near the Salt Lake Boulevard alignment (as shown in Table 4-5 and in the list of references at the end of this section) and these are concentrated at the north end adjacent to Pearl Harbor (Cluff, 1970; Barrera, 1971; Erkelens, 1995; Hammatt, 1995a). The extensive Bishop Museum documentation associated with the H-3 project (for both Hālawā and the previously considered Moanalua Valley) may include pertinent data for seaward lands as well as overall studies of Fort Shafter (Hammatt, 1984) and Hickam (Jordan, 1980).

Table 4-6. Section III Salt Lake-Boulevard Previous Archaeological Studies

Source	Nature of Study	TMK [1] - -	Location
Avery, et al., 1994	Paleo-environmental Study	9-9-001, 9-9-003:	Hālawā Stream Mouth
Barrera, 1971	Archaeological Site Survey	9-9-	Honolulu Stadium
Cluff, 1970	Inventory Survey	9-9-	Hālawā Interchange
Cochrane and Athens, 2000	Monitoring Plan	9-9-000:000	Bilge and Oil Facilities
Crozier, 1974	Settlement Plan	Various	Focused on three valleys
Dye, 1999	Archaeological Resources Survey	9-9-001:001; 9-9-002:004; 9-9-003:026, 9-9-003:029, 9-9-003:056	Hālawā Bridge, Hālawā
Erkelens, 1995	Archaeological Study	9-9-001:	Ford Island Bridge
Guerriero and Spear, 1994	Inventory Survey	1-5-008:001, 1-5-008:009, 1-5-008:011	Proposed Reservoir and Well Sites
Hammatt, 1995a	Reconnaissance Survey	9-9-003:035	Proposed Hālawā Well – 2 acres

Source	Nature of Study	TMK [1] --	Location
Jackson, et al., 1994	Data Recovery	1-1-008	Child Development Center, Fort Shafter
Rechtman and Henry, 1998	Reconnaissance Survey	Various	Red Hill Fuel Storage Area
Williams, 1993	Monitoring and Testing	9-9-001:016	Hālawā
Williams, 1994	Inventory Survey	9-9-001:016	Hālawā
Yent and Ota, 1981	Reconnaissance Survey	9-8-, 9-9-	Proposed Rainbow Bay State Park

Mauka of the Airport Viaduct

For purposes of this study, the area of archaeological concern is almost identical for both areas *mauka* and *makai* of the Airport Viaduct alignments. The task is to analyze the voluminous data (approximately 200 studies) pertaining to Hickam Air Force Base and the Pearl Harbor Naval Base (many listed in the Section III bibliography, but not presented in table form). Fortunately, preliminary analysis (informed in particular by Anderson and Bouthillier, 1996a, 1996b) indicates that the majority of cultural resources and report study areas lie along the coast. This coastal zone is significantly richer and different archaeologically from the more *mauka* lands of the proposed segments. An appropriate and convenient demarcation line is that of Kuntz and Vandenburg Avenues (Figure 4-10). The current study area is almost exclusively north of this line.

Makai of the Airport Viaduct

Please see discussion under “Mauka of Airport Viaduct,” above.

Aolele Street

The research conducted on the neighboring Kamehameha Highway/Airport Viaduct alignments (see discussion under “Mauka of Airport Viaduct,” above) is directly pertinent to this short alternate route along Aolele Street. A study for a proposed detention facility (Sprinkle, 1996) is one of the few projects specific to this area.

Section III – Aloha Stadium to Middle Street References

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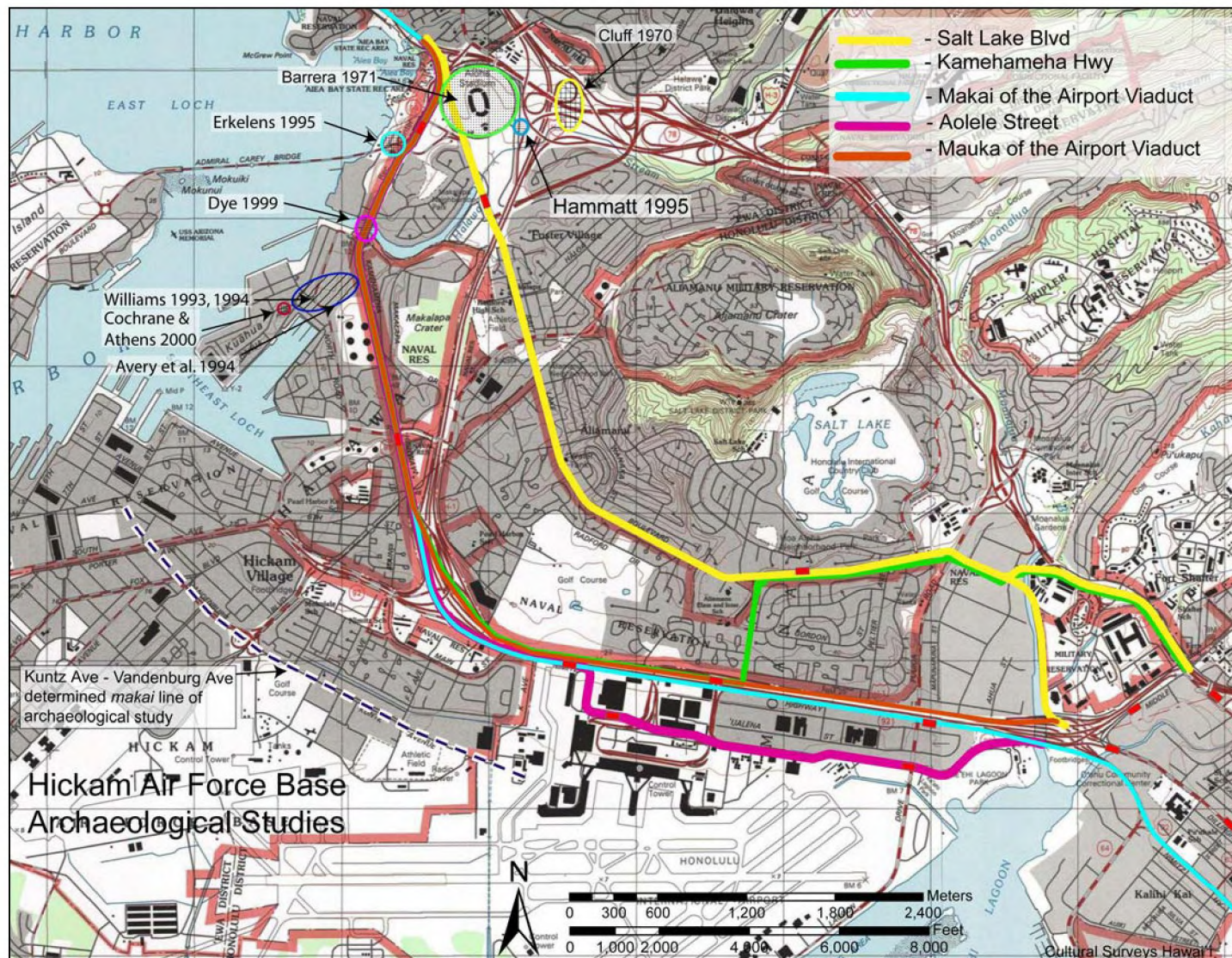


Figure 4-10. Pertinent prior archaeological investigations within Section III

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Section IV – Middle Street to Iwilei

North King Street

The North King Street alignment between Middle Street on the west and Nu'uuanu Stream on the east skirts much of the preferred traditional Hawaiian cultural landscape that lies *makai*. Thus it is expected that this alignment would contain fewer cultural resources and burials than the Dillingham Boulevard alignment, although burials have been reported from both alignments. For its relatively short length this alignment has been well documented in the archaeological literature, as summarized in Table 4-6 and the references listed at the end of this section.

Table 4-7. Section IV North King Street Previous Archaeological Studies

Source	Nature of Study	TMK [1] -	Location
Borthwick, et al., 1995	Inventory Survey	1-5-001:001	Kapālama
Chiogioji and Hammatt, 2000	Monitoring Plan	1-5-006, 1-5-007, 1-5-008, 1-7-026, 1-7-027	Nu'uuanu, Liliha
Cleghorn and Guerriero, 1998	Literature Review	1-1, 1-2-	Moanalua
Folk, et al., 1992	Inventory Survey	1-2-016:007	Kalihi
Folk and Hammatt, 1993	Mitigation Plan	1-2-016:007	Kalihi-Middle Street
Hammatt, 1995b	Burial Report	1-5-005:	Kalihi-Austin Lane
Hammatt and Chiogioji, 2001a	Monitoring	1-5-006, 1-5-007, 1-5-008, 1-7-026	Nu'uuanu, Liliha
Hammatt and Folk, 1992	Burial Report	1-2-016:007	Kalihi-Middle Street
Jourdane, 1994	Burial Report	1-5-005	Kalihi-Austin Lane
Landrum and Klieger, 1991	Literature Review	1-2-016:007	Kalihi
McDermott and Mann, 2001	Inventory Survey Report	1-5-008, 1-7-001, 2-1-002	Nu'uuanu

Source	Nature of Study	TMK [1] -	Location
Nakamura, et al., 1994	Assessment	1-6-003:042, 1-6-003:043, 1-6-003:044, 1-6-003:045, 1-6-003:046, 1-6-003:051, 1-6-003:052, 1-6-003:053, 1-6-003:079, 1-6-003:080, 1-6-003:081, 1-6-003:087, 1-6-003:089	Kapālama-King Street
Neller, 1980a	Reconnaissance Survey	1-5-005:014	Kapālama
O'Hare, et al., 2003a	Data Recovery Plan	1-5-008, 1-7-001, 2-1-002	Nu'uano
Ostroff, et al., 2002	Monitoring	1-5-006, 1-5-007, , -5-008 1-7-026, 1-7-027	Nu'uano, Liliha
Shideler and Hammatt, 2002	Assessment	1-2-018:001, 1-2-018:002, 1-2-018:003, 2-018:008, 2-018:009, 1-2-018:010	Kalihi-Middle Street

Dillingham Boulevard

The Dillingham Boulevard alignment is also relatively well studied along its short length, as summarized in Table 4-7 and the listed references at the end of this section. The alignment's proximity to coastal resources, including extensive fishponds, probably encouraged more habitation than did the North King Street alignment.

Table 4-8. Section IV Dillingham Boulevard Previous Archaeological Studies

Source	Nature of Study	TMK [1] -	Location
Chiogioji and Hammatt, 1995	Assessment	1-5-020, 1-5-034, 1-5-041, 1-5-042	Kapālama-Sand Island
Chiogioji and Hammatt, 2000	Monitoring Plan	1-5-006, 1-5-007, 1-5-008, 1-7-026, 1-7-027	Nu'uano, Liliha
Cleghorn and Guerriero, 1998	Literature Review	1-2-, 1-1-	Moanalua
Hammatt, 1995b	Burial Report	1-5-005	Kalihi-Austin Lane
Hurst and Pantaleo, 1992	Literature Review	1-5-007:001, 1-5-07:014, 1-5-007:015, 1-5-07:018, 1-5-007:057, 1-5-07:058, 1-5-007:060 to 1-5-007:078	Kapālama-Liliha Civic Center
Jourdane, 1994	Burial Report	1-5-005	Kalihi-Austin Lane
McDermott and Mann, 2001	Inventory Survey	1-5-008, 1-7-001, 2-1-002	Nu'uano
McGerty, et al., 1997	Data Recovery	1-5-007:001, 1-5-07:014, 1-5-007:015, 1-5-07:018, 1-5-007:057, 1-5-07:058, 1-5-007:060 to 1-5-007:078	Kalihi, Kapālama
Neller, 1980a	Reconnaissance Survey	1-1-5-005:014	Kapālama

Source	Nature of Study	TMK [1] -	Location
O'Hare, et al., 2003a	Data Recovery Plan	1-5-008, 1-7-001, 2-1-002	Nu'uanu
O'Hare, et al., 2003b	Data Recovery Plan	1-5-007:001, 1-5-07:014, 1-5-007:015, 1-5-07:018, 1-5-007:057, 1-5-07:058, 1-5-007:060 to 1-5-007:078	Iwilei-Kūwili Fishpond
Ostroff et al., 2002	Monitoring	1-5-006, 1-5-007, 1-5-008, 1-7-026, 1-7-027	Nu'uanu, Liliha
Shideler and Hammatt, 2002	Assessment	1-2-018:001, 1-2-018:002, 1-2-018:003, 1-2-018:008, 1-2-18:009, 1-2-018010	Kalihi-Middle Street

Beretania Street Tunnel Vicinity (near Nu'uanu Stream)

This short stretch on the northwest side of the mouth of Nu'uanu Stream merits close attention as all routes (North King Street, Dillingham Boulevard, Hotel Street and Nimitz alignments) converge at this location. Furthermore, the former Hawaiian village of Kou was located in the vicinity, which may increase historic preservation concern for this area. To avoid repetition of information pertinent to all of the alignments, this area is treated as a separate study node. The immediate vicinity is relatively well studied, as shown in Table 4-8 and the following list of references at the end of this section.

Table 4-9. Section IV, Beretania Street Tunnel Vicinity Previous Archaeological Studies

Source	Nature of Study	TMK [1] - -	Location
Ching and Kwan, 1987	Literature Review	7-000:000, 2-1-000:000	Honolulu town
Chiogioji and Hammatt, 2000	Monitoring Plan	1-5-006, 1-5-007, 1-5-008, 1-7-026, 1-7-027,	Nu'uanu, Liliha
Cleghorn, 2003	Monitoring Plan	1-4-004, 1-7-002, 1-7-003, 1-7-004, 2-1-002, 2-1-003	Nu'uanu-Chinatown
Colin and Hammatt, 1997a	Monitoring Plan	1-7-002, 1-7-003, 2-1-002, 2-1-013, 2-1-014, 2-1-015, 2-1-016, 2-1-025, 2-1-027, 2-1-029, 2-1-30, 2-1-031, 2-1-032	Nimitz Highway
Denham, et al., 1992	Inventory Survey	1-7-003:032	Nu'uanu
Elmore and Kennedy, 2001	Monitoring	1-7-002:000, 1-7-003:000, 2-1-002:000	Nu'uanu
Erkelens, et al., 1994	Burial Report	1-7-003:020	Nu'uanu-Kekaulike Park
Goodwin, 1994	Mitigation Plan	1-7-003:	Nu'uanu-Kekaulike Park
Goodwin, 1997	Inventory Survey	1-7-003:020, 1-7-003:023, 1-7-003:024	Nu'uanu-Kekaulike Park
Goodwin, et al., 1992	Burial Report	1-7-002:003, 1-7-002:004, 1-7-002:005	Nu'uanu-Marin Tower

Source	Nature of Study	TMK [1] - -	Location
Goodwin, et al., 1996	Data Recovery	1-7-002:003, 004, 005, 042	Nu'uanu-Marin Tower
Hammatt and Chiogioji, 2001a	Monitoring	1-5-006, 1-5-007, 1-5-008, 1-7-026	Nu'uanu, Liliha
Heidel and Hammatt, 1994	Data Recovery	1-7-003:014	Nu'uanu-Chinatown
Hurst, 1990	Literature Review	1-7-004:001, 1-7-004:004	Smith Street
Hurst, 1991	Literature Review	1-7-003	Nu'uanu-Kekaulike Park
Kennedy and Riley, 1995	Fishpond Study	1-7-003:032	Nu'uanu
Kennedy, et al., 1994	Inventory Survey	1-7-003:032	Nu'uanu-Kekaulike Park
Landrum and Dixon, 1992	Mitigation	1-7-002:027	Nu'uanu
Lebo, 1997	Data Recovery Plan	1-7-002:002	Nu'uanu
Lebo and McGuirt, 2000a	Geological Report	1-7-002:002	Nu'uanu
Mann and Hammatt, 2002a	Monitoring	1-7-, 2-1-	King Street
McGerty, et al., 1995	Assessment Report	1-7-003:014, 015	Nu'uanu-Chinatown
Lebo and McGuirt, 2000b	Data Recovery	1-7-002:002	Nu'uanu
Perzinski and Hammatt, 2002	Monitoring Plan	1-7-003, 1-7-004	Nu'uanu-Chinatown
Pietrusewsky and Douglas, 1989	Burial Report	1-7-002:027	Nu'uanu
Riley, et al., 1995	Data Recovery	1-7-003:032	Nu'uanu-Kekaulike Park

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Section V – Iwilei to UH Mānoa

Figure 4-11 shows various alternative alignments through Downtown Honolulu. These alignments are shown in relation to pertinent prior archaeological investigations in the downtown area, as well as the boundaries of the Chinatown, Merchant, and Hawai‘i Capital Historic Districts. Most of the Section V alignments either pass through one or more of these historic districts, or at least skirt their boundaries. Prior archaeological research in Downtown Honolulu has documented rich archaeological remains, predominantly historic and some prehistoric components, that are preserved beneath the modern land surface.

Hotel Street/Kawaiaha'o Street (and Tunnel)

Entering the core area of Downtown Honolulu greatly increases the prospect of uncovering significant archaeological finds. From the beginnings of a Hawaiian village taking advantage of the waters of Nu'uannu Stream and the protected reef, to the 18th-century center of first contacts with the west on O'ahu, to the bustling seaport of the Kingdom, these streets are rich with the remains of former times. Currently, it is impossible to characterize in detail and certainty the likely finds of one alignment over another. Fortunately the rich archaeological record (as shown in Table 4-9 and the following list of references) should provide sufficient data to draw conclusions.

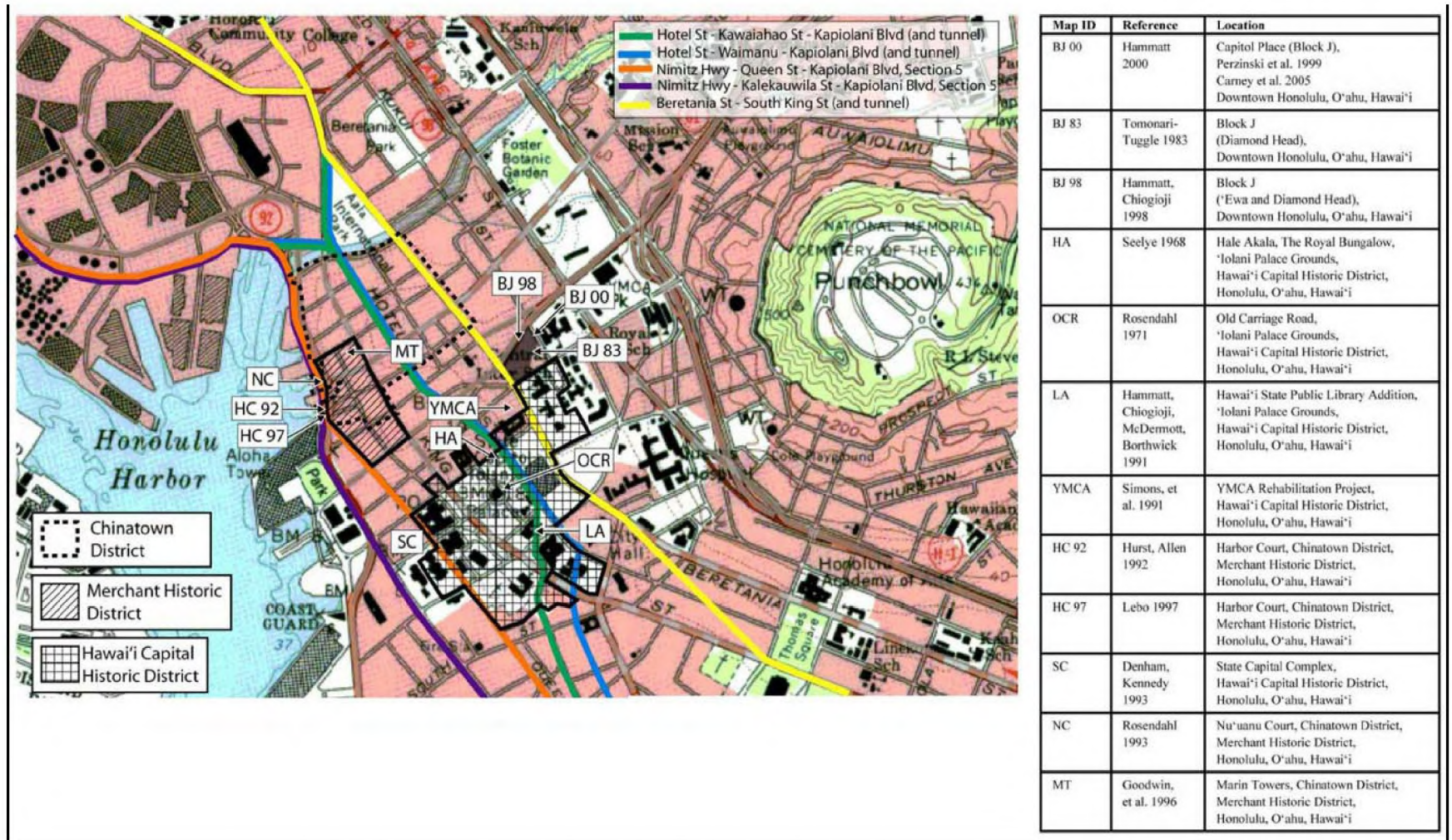


Figure 4-11. Alignments of Alternative 4, Section V through Downtown Honolulu's Historic Districts

Table 4-10. Section V – Hotel Street/Kawaiaha‘o Street (and Tunnel) Previous Archaeological Research

Source	Nature of Study	TMK	Location
Bath, 1987	Burial Report	2-1-026:022	Honolulu town
Charvet-Pond and Pantaleo, 1989	Literature Review	2-1-003:015, 2-1-003:023, 2-1-003:024, 2-1-003:025	Chinatown
Chiogioji and Hammatt, 2005a	Monitoring Plan	1-2-1-002, 2-1-003, 2-1-012	Fort St. Mall
Chiogioji, et al., 1991	Investigations Report	2-1-025:001	Hawai'i Library
Cleghorn, 1989	Data Recovery	2-1-003:015	Chinatown
Cleghorn, 2003	Monitoring Plan	1-4-004, 1-7-002, 1-7-003, 1-7-004, 2-1-002, 2-1-003	Nu'uano-Chinatown
Colin and Hammatt, 1997b	Burial Report	1-7-002, 1-7-003, 2-1-002, 2-1-013, 2-1-014, 2-1-015, 2-1-016, 2-1-025, 2-1-027, 2-1-029, 2-1-30, 2-1-031, 2-1-032	Nimitz Hwy
Davis and McGerty, 2002	Assessment	1-1-, 1-9-, 2-	Hon. Rap. Tr.
Denham, 1993	Monitoring	2-1-025:002	Nu'uano-Capitol
Dunn, et al., 1993	Inventory Survey	2-1-002:026	Nu'uano Court
Dye, 2001	Monitoring Plan	2-1-017:001, 2-1-017:002	Capitol
Dye, 2002	Monitoring	2-1-017:001, 2-1-017:002	Capitol
Dye and Puette, 2003	Monitoring Plan	2-1-025:003	Capitol
Fairfax, 1971	Data Recovery	2-1-025:002	Nu'uano-Capitol
Fairfax, 1972	Salvage Report	2-1-025:002	Nu'uano-Capitol
Fairfax, 1973	Data Recovery	2-1-025:002	Nu'uano-Capitol
Fairfax, n.d.	Data Recovery	2-1-025:002	Nu'uano-Capitol
Griffin, et al., 1987	Literature Review	2-1-, 2-1-029:001, 2-1-031	Kākā'āko
Hammatt, 1990	Data Recovery	2-1-025:001	Hawai'i Library
Hammatt and Borthwick, 1989	Assessment	2-1-017:007	Hotel Street
Hammatt and Chiogioji, 2001b	Monitoring Plan	2-1-002:000, 2-1-011:000, 2-1-012:000, 2-1-025:000, 2-1-032:000, 2-1-033:000	King Street
Hawai'i Bottle Museum, 1980	Historic Artifact Analysis	2-1-017:003, 2-1-017:004	Nu'uano
Hawai'i Bottle Museum, 1981	Historic Artifact Analysis	2-1-011:007	Nu'uano
Hawai'i Bottle Museum, 1981	Historic Artifact Analysis	2-1-010:046	Nu'uano
Hawai'i Bottle Museum, 1982	Historic Artifact Analysis	2-1-012:004	Nu'uano
Hurst, 1991	Data Recovery	2-1-002:016, 2-1-002:020, 2-1-002:056	Nu'uano-Harbor Court
Hurst, 1992	Monitoring and Inventory Survey	2-1-002:016, 2-1-002:020, 2-1-002:056	Nu'uano-Harbor Court

Source	Nature of Study	TMK	Location
Hurst, 1994	Literature Review	2-1-002:016, 2-1-002:020, 2-1-002:056	Nu'uanu-Harbor Court
Kawachi, 1990	Monitoring	2-1-025:002	Nu'uanu-Capitol
Kennedy, 1984	Investigations Report	2-1-002:038, 2-1-002:039	Nu'uanu
Lebo, et al., 1997	Data Recovery	2-1-002:016, 2-1-002:020, 2-1-002:056	Nu'uanu-Harbor Court
Luscomb, et al., 1976	Inventory Survey	2-1-025:002	Nu'uanu-Capitol
Moore, 1992	Assessment	2-1-002:016, 2-1-002:020, 2-1-002:056	Nu'uanu-Harbor Court
Pantaleo and Sinoto, 2002	Monitoring Plan	2-1-025:004	Capitol
Pfeffer, et al., 1993	Literature Review	2-1-029, 2-1-030, 2-1-031, 2-1-032, 2-1-046, 2-1-047, 2-1-048, 2-1-051, 2-1-054, 2-1-055	Pauoa-Kākā'āko ID-1
Putzi & Dye, 2004	Monitoring	2-1-025:003	Honolulu town
Rosendahl, 1971	Data Recovery	2-1-025:002	Nu'uanu-Capitol
Seelye, 1968	Reconnaissance Survey	2-1-025:002	Nu'uanu
Simons, et al., 1991	Monitoring	2-1-017:001	Honolulu town
Sinoto, 1977	Inventory Survey	2-1-025	Capitol
Spilker, 1974	Salvage Report	2-1-025:002	Nu'uanu-Capitol
Winieski and Hammatt, 2000a	Monitoring	2-1-030:000, 2-1-031:000, 2-1-032:000, 2-1-044:000, 2-1-046:000, 2-1-047:000, 2-1-048:000, 2-1-050:000, 2-1-051:000, 2-1-052:000, 2-1-054:000	Kākā'āko ID-3
Winieski and Hammatt, 2001a	Monitoring	2-1-002, 2-1-013, 2-1-014, 2-1-015, 2-1-016, 2-1-025, 2-1-027, 2-1-029, 2-1-030, 2-1-031, 2-1-032, 7-2-003, 7-2-003:	Nimitz Hwy

Hotel Street/Waimanu Street (and Tunnel)

At this time it is impossible to characterize in detail and certainty the likely finds of one alignment through Downtown Honolulu over another. Fortunately the rich archaeological record (as shown in Table 4-10 and the following list of references) should provide sufficient data to draw conclusions.

Table 4-11. Section V – Hotel Street/Waimanu Street (and Tunnel) Previous Archaeological Studies

Source	Nature of Study	TMK	Location
Charvet-Pond and Pantaleo, 1989	Literature Review	2-1-003:015, 2-1-003:023, 2-1-003:024, 2-1-003:025	Chinatown
Chiogioji and Hammatt, 2005a	Monitoring Plan	2-1-002, 2-1-003, 2-1-012	Fort St. Mall
Cleghorn, 1989	Data Recovery	2-1-003:015	Chinatown
Cleghorn, 2003	Monitoring Plan	1-4-004, 1-7-002, 1-7-003, 1-7-004, 2-1-002, 2-1-003	Nu'uanu-Chinatown
Colin and Hammatt, 1997b	Burial Report	2-1-002, 2-1-013, 2-1-014, 2-1-015, 2-1-016, 2-1-025, 2-1-027, 2-1-030, 2-1-031, 2-1-032, 7-0-002	Nimitz Hwy
Davis and McGerty, 2002	Assessment	1- , 2-, 9-	Hon. Rap. Tr.
Dunn, et al. 1993	Inventory Survey	2-1-002:026	Nu'uanu Court
Dye, 2001	Monitoring Plan	2-1-017:001, 2-1-017:002	Capitol
Dye, 2002	Monitoring	2-1-017:001, 2-1-017:002	Capitol
Griffin, et al., 1987	Literature Review	2-1-, 2-1-029:001, 2-1-031	Kākā'āko
Hammatt and Borthwick, 1989	Assessment	2-1-017:007	Hotel St.
Hawai'i Bottle Museum, 1980	Historic Artifact Analysis	2-1-017:003, 2-1-017:004	Nu'uanu
Hawai'i Bottle Museum, 1981	Historic Artifact Analysis	2-1-011:007	Nu'uanu
Hawai'i Bottle Museum, 1981	Historic Artifact Analysis	2-1-010:046	Nu'uanu
Hawai'i Bottle Museum, 1982	Historic Artifact Analysis	2-1-012:004	Nu'uanu
Hurst, 1991	Data Recovery	2-1-002:016, 2-1-002:020, 2-1-002:056	Nu'uanu-Harbor Court
Hurst, 1992	Monitoring and Inventory Survey	2-1-002:016, 2-1-002:020, 2-1-002:056	Nu'uanu-Harbor Court
Hurst, 1994	Literature Review	2-1-002:016, 2-1-002:020, 2-1-002:056	Nu'uanu-Harbor Court
Kennedy, 1984	Investigations	2-1-002:038, 2-1-002:039	Nu'uanu
Lebo, et al., 1997	Data Recovery	2-1-002:016, 2-1-002:020, 2-1-002:056	Nu'uanu-Harbor Court
Moore, 1992	Assessment	2-1-002:016, 2-1-002:020, 2-1-002:056	Nu'uanu-Harbor Court
Pfeffer, et al., 1993	Literature Review	2-1-029, 2-1-030, 2-1-031, 2-1-032, 2-1-046, 2-1-047, 2-1-048, 2-1-051, 2-1-054, 2-1-055	Pauoa-Kākā'āko ID-1
Simons, et al., 1991	Monitoring	2-1-017:001	Honolulu town

Source	Nature of Study	TMK	Location
Winieski and Hammatt, 2000a	Monitoring	2-1-030:000, 2-1-031:000, 2-1-032:000, 2-1-044:000, 2-1-046:000, 2-1-047:000, 2-1-048:000, 2-1-050:000, 2-1-051:000, 2-1-052:000, 2-1-054:000	Kākā'āko ID-3
Winieski and Hammatt, 2001a	Monitoring	2-1-002, 2-1-013, 2-1-014, 2-1-015, 2-1-016, 2-1-025, 2-1-027, 2-1-029, 2-1-030, 2-1-031, 2-1-032, 7-2-003, 7-2--003:	Nimitz Hwy

Nimitz Highway/Queen Street

At this time it is impossible to characterize the likely finds of one alignment through Downtown Honolulu over another in any detail and certainty. Fortunately the rich archaeological record (refer to Table 4-11 and the following list of references) should provide sufficient data to draw conclusions.

Table 4-12. Section V – Nimitz Highway/Queen Street Previous Archaeological Studies

Source	Nature of Study	TMK [1] -	Location
Bath, 1987	Burial	2-1-026:022	Honolulu town
Charvet-Pond and Pantaleo, 1989	Literature Review	2-1-003:015, 2-1-003:023, 2-1-003:024, 2-1-003:025	Chinatown
Chiogioji and Hammatt, 2005a	Monitoring Plan	2-1-002, 2-1-003, 2-1-012	Fort St. Mall
Chiogioji and Hammatt, 2005b	Monitoring Plan	2-1-014, 2-1-027	Aloha Drive
Chiogioji and Hammatt, 2005c	Monitoring Plan	2-1-016, 2-1-026, 2-1-027, 2-1-029, 2-1-030, 2-1-031, 2-1-051, 2-1-054, 2-1-055	Kākā'āko
Chiogioji, et al., 1991	Investigations	2-1-025:001	Hawai'i Library
Cleghorn, 1989	Data Recovery	2-1-003:015	Chinatown
Cleghorn, 2003	Monitoring Plan	1-4-004, 1-7-003, 1-7-004, 2-1-002, 2-1-003, 1-7-002	Nu'uano-Chinatown
Colin and Hammatt, 1997b	Burial Report	2-1-002, 2-1-013, 2-1-014, 2-1-015, 2-1-016, 2-1-025, 2-1-027, 2-1-030, 2-1-031, 2-1-032, 1-7-0-002	Nimitz Hwy
Davis and McGerty, 2002	Assessment	1-, 2-, 9-	Honolulu Rapid Transit
Denham, 1993	Monitoring	2-1-025:002	Nu'uano-Capitol
Dunn, et al. 1993	Inventory Survey	2-1-002:026	Nu'uano Court
Dye and Puette, 2003	Monitoring Plan	2-1-025:003	Capitol
Fairfax, 1971	Data Recovery	2-1-025:002	Nu'uano-Capitol

Source	Nature of Study	TMK [1] -	Location
Fairfax, 1972	Salvage t	2-1-025:002	Nu'uanu-Capitol
Fairfax, 1973	Data Recovery	2-1-025:002	Nu'uanu-Capitol
Fairfax, n.d.	Data Recovery	2-1-025:002	Nu'uanu-Capitol
Griffin, et al., 1987	Literature Review	2-1-, 2-1-029:001, 2-1-031:	Kākā'āko
Hammatt, 1990	Data Recovery	2-1-025:001	Hawai'i Library
Hammatt and Chiogioji, 2001b	Monitoring Plan	2-1-002:000, 2-1-011:000, 2-1-012:000, 2-1-025:000, 2-1-032:000, 2-1-033:000	King St
Hurst, 1991	Data Recovery	2-1-002:016, 2-1-002:020, 2-1-002:056	Nu'uanu-Harbor Court
Hurst, 1992	Monitoring and Inventory Survey	2-1-002:016, 2-1-002:020, 2-1-002:056	Nu'uanu-Harbor Court
Hurst, 1994	Literature Review	2-1-002:016, 2-1-002:020, 2-1-002:056	Nu'uanu-Harbor Court
Kawachi, 1990	Monitoring	2-1-025:002	Nu'uanu-Capitol
Kennedy, 1984	Investigations Report	2-1-002:038, 2-1-002:039	Nu'uanu
Lebo, et al., 1997	Data Recovery	2-1-002:016, 2-1-002:020, 2-1-002:056	Nu'uanu-Harbor Court
Luscomb, et al., 1976	Inventory Survey	2-1-025:002	Nu'uanu-Capitol
Moore, 1992	Assessment	2-1-002:016, 2-1-002:020, 2-1-002:056	Nu'uanu-Harbor Court
Pantaleo and Sinoto, 2002	Monitoring Plan	2-1-025:004	Capitol
Pfeffer, et al., 1993	Literature Review	2-1-029, 2-1-030, 2-1-031, 2-1-032, 2-1-046, 2-1-047, 2-1-048, 2-1-051, 2-1-054, 2-1-055	Pauoa-Kākā'āko ID-1
Putzi and Dye, 2004	Monitoring	2-1-025:003	Honolulu town
Rosendahl, 1971	Data Recovery	2-1-025:002	Nu'uanu-Capitol
Seelye, 1968	Reconnaissance Survey	2-1-025:002	Pauoa
Sinoto, 1977	Inventory Survey	2-1-025:	Capitol
Spilker, 1974	Salvage	2-1-025:002	Nu'uanu-Capitol
Terry, et al., 2004	Monitoring Plan	2-1-015, 2-1-025, 2-1-026, 2-1-027, 2-1-029, 2-1-030 2-1-031, 2-1-032, 2-1-033	Makiki-Punchbowl
Winieski and Hammatt, 2000a	Monitoring	2-1-030:000, 2-1-031:000, 2-1-032:000, 2-1-044:000, 2-1-046:000, 2-1-047:000, 2-1-048:000, 2-1-050:000, 2-1-051:000, 2-1-052:000, 2-1-054:000	Kākā'āko ID-3
Winieski and Hammatt, 2001a	Monitoring	2-1-002, 2-1-013, 2-1-014, 2-1-015, 2-1-016, 2-1-025, 2-1-027, 2-1-029, 2-1-030, 2-1-031, 2-1-032, 7-2-003	Nimitz Hwy

Nimitz Highway/Halekauwila Street

At this time it is impossible to characterize the likely finds of one alignment through Downtown Honolulu over another. Fortunately the rich archaeological record (as shown in Table 4-12 and the following list of references) should provide sufficient data to draw conclusions.

Table 4-13. Section V – Nimitz Highway/Halekauwila Street Previous Archaeological Studies

Source	Nature of Study	TMK [1]-	Location
Athens, 1986	Monitoring	2-1-030:003, 2-1-030:004, 2-1-030:038, 2-1-030:039	Capitol
Bath, 1987	Burial Report	2-1-026:022	Honolulu town
Chiogioji and Hammatt, 2005b	Monitoring Plan	2-1-014, 2-1-027	Aloha Drive
Chiogioji and Hammatt, 2005c	Monitoring Plan	2-1-016, 2-1-026, 2-1-027, 2-1-029, 2-1-030, 2-1-031, 2-1-051, 2-1-054, 2-1-055	Kākā'āko
Cleghorn, 2003	Monitoring Plan	1-4-004, 1-7-003, 1-7-004, 2-1-002, 2-1-003, 1-7-002	Nu'uano-Chinatown
Colin and Hammatt, 1997b	Burial Report	2-1-002, 2-1-013, 2-1-014, 2-1-015, 2-1-016, 2-1-025, 2-1-027, 2-1-030, 2-1-031, 2-1-032, 1-7-0-002	Nimitz Highway
Hammatt and Chiogioji, 1995	Assessment	Various	Kākā'āko
Hammatt and Chiogioji, 2001b	Monitoring Plan	2-1-002:000, 2-1-011:000, 2-1-012:000, 2-1-025:000, 2-1-032:000, 2-1-033:000	King Street
Hawai'i Bottle Museum, 1981	Historic Artifact Analysis	2-1-010:046	Nu'uano
Kennedy, 1993	Burial Report	2-1-030:020	South Street
Leidemann, 1988	Historic Artifact Analysis	2-1-030:	Capitol
Pfeffer, et al., 1993	Literature Review	2-1-029, 2-1-030, 2-1-031, 2-1-032, 2-1-046, 2-1-047, 2-1-048, 2-1-051, 2-1-054, 2-1-055	Pauoa-Kākā'āko ID-1
Smith and Rosendahl, 1990	Cultural Resource Assessment	2-1-001:	Pauoa-Aloha Tower
Winieski and Hammatt, 2000a	Monitoring	2-1-030:000, 2-1-031:000, 2-1-032:000, 2-1-044:000, 2-1-046:000, 2-1-047:000, 2-1-048:000, 2-1-050:000, 2-1-051:000, 2-1-052:000, 2-1-054:000	Kākā'āko ID-3
Winieski and Hammatt, 2001a	Monitoring	2-1-002, 2-1-013, 2-1-014, 2-1-015, 2-1-016, 2-1-025, 2-1-027, 2-1-029, 2-1-030, 2-1-031, 2-1-032, 7-2-003, -003	Nimitz Highway

Beretania Street/South King Street

At this time it is impossible to characterize in detail and certainty the likely finds of one alignment through Downtown Honolulu over another. Fortunately the rich archaeological record (as shown in Table 4-13 and the following list of references) should provide sufficient data to draw conclusions.

Table 4-14. Section V – Beretania Street/South King Street Previous Archaeological Studies

Source	Nature of Study	TMK	Location
Chiogioji, 1992	Assessment	2-3-009:001	Kapi'olani
Chiogioji and Hammatt, 2003a	Monitoring Plan	2-3-002, 2-3-003	Kākā'āko, Kewalo
Chiogioji and Hammatt, 2005d	Literature Review	2-4-005:023	Makiki-Young Street
Davis and McGerty, 2002	Assessment	1-, 2-, 9-	Hon. Rap. Tr.
Esh and Hammatt, 2004a	Monitoring	2-3-006, 2-3-007, 2-3-010, 2-3-011, 2-3-012, 2-3-014, 2-3-015, 2-3-035, 2-3-038, 2-4-003, 2-4-004, 2-4-010, 2-4-012	Ala Moana
Ferrall, 1976	Geological Report	2-3-	Kākā'āko, Mō'ili'ili
Griffin, et al., 1987	Literature Review	2-1-, 2-1-029:001, 2-1-029-031	Kākā'āko
Hammatt and Chiogioji, 2001b	Monitoring Plan	2-1-002, 2-1-011, 2-1-012, - 2-1-025:000, 2-1-032, 2-1-033:	King Street
Hurst and Pantaleo, 1991	Literature Review	2-4-005:001	Pāwa'a
Pfeffer, et al., 1993	Literature Review	2-1-029, 2-1-030, 2-1-031, 2-1-032, 2-1-046, 2-1-047, 2-1-048, 2-1-051, 2-1-054, 2-1-055	Pauoa-Kākā'āko ID-1
Terry, et al., 2004	Monitoring Plan	2-1-015, 2-1-025, 2-1-026, 2-1-027, 2-1-029, 2-1-030, 2-1-031, 2-1-032, 2-1-033	Makiki-Punchbowl
Tulchin and Hammatt, 2004	Literature Review	2-3-004, 2-3-005, 2-3-007, 2-3-009, 2-3-010, 2-3-013, 2-3-014, 2-3-017, 2-3-018, 2-3-022, 2-3-035, 2-3-036, 2-3-038	Kapi'olani
Winieski and Hammatt, 2000a	Monitoring	2-1-030:000, 2-1-031:000, 2-1-032:000, 2-1-044:000, 2-1-046:000, 2-1-047:000, 2-1-048:000, 2-1-050:000, 2-1-051:000, 2-1-052:000, 2-1-054:000	Kākā'āko ID-3

Beretania Street/South King Street Tunnel

At this time it is impossible to characterize in detail and certainty the likely finds of one alignment through Downtown Honolulu over another. Fortunately the rich archaeological record (as shown in Table 4-14 and the following list of references) should provide sufficient data to draw conclusions.

Table 4-15. Section V – Beretania Street/South King Street Tunnel

Source	Nature of Study	TMK [1] -	Location
Anderson, 1995	Inventory Survey	2-1-004:041, 2-1-004:042, 2-1-004:043	King Street
Carpenter and Majors, 2000	Monitoring	2-1-018:001	Nu'uaniu-Washington Pl.
Carpenter and Yent, 1995	Monitoring	2-1-018:001	Nu'uaniu Washington Pl.
Charvet-Pond and Pantaleo, 1989	Literature Review	2-1-003:015, 2-1-003:023, 2-1-003:024, 2-1-003:025	Chinatown
Chiogioji and Hammatt, 1994	Assessment	2-1-018:001, 2-1-018:011, 2-1-018:016, 2-1-018:046, 2-1-018:047	Honolulu town
Chiogioji and Hammatt, 2005a	Monitoring Plan	2-1-002, 2-1-003, 2-1-012	Fort Street Mall
Cleghorn, 1989	Data Recovery	2-1-003:015	Chinatown
Cleghorn, 2003	Monitoring Plan	1-4-004, 1-7-003, 1-7-004, 2-1-002, 2-1-003, 1-7-002;	Nu'uaniu-Chinatown
Davis and McGerty, 2002	Assessment	1-, 2-, 9-	Honolulu Rapid Transit
Dockall, 2001		2-1-018:001	Nu'uaniu-Washington Pl.
Dockall, et al., 2003	Inventory Survey	2-1-018:001	Nu'uaniu-Washington Pl.
Donham, 1980	Burial Report	2-1-018:042; 8-4-002	Nu'uaniu
Dye, 2001	Monitoring Plan	2-1-017:001, 2-1-017:002	Capitol
Dye, 2002	Monitoring	2-1-017:001, 2-1-017:002	Capitol
Griffin, et al., 1987	Literature Review	2-1-, 2-1-029:001, 2-1-029:-031:	Kā kā'āko
Hammatt, 1988	Assessment	2-1-009:018	Nu'uaniu-Block J
Hammatt and Borthwick, 1989	Assessment	2-1-017:007	Hotel Street
Hammatt and Chiogioji, 1998b	Assessment	2-1-009:018, 2-1-009:027	Nu'uaniu
Hammatt and Shideler, 2005	Monitoring Plan	2-1-009:011, 2-1-009:013, 2-1-009:018	Nu'uaniu-Block J (Capital Place)
Hawai'i Bottle Museum, 1980	Historic Artifact Analysis	2-1-017:003, 2-1-017:004	Nu'uaniu
Hawai'i Bottle Museum, 1981	Historic Artifact Analysis	2-1-010:046	Nu'uaniu
McDermott, Shideler, et al., 1999	Data Recovery Plan	2-1-009:018	Nu'uaniu-Block J

Source	Nature of Study	TMK [1] -	Location
Nagata and Carpenter, 1995	Monitoring	2-1-018:001	Nu'uanu-Washington Pl.
O'Hare, et al, 2006c	Inventory Survey Plan	2-1-018:048; 2-1-035:001, 2-1-003, 2-1-004, 2-1-005, 2-1-006, 2-1-007, 2-1-008, - 2-1-008, 2-1-037:002	Queen's Medical Center
O'Hare, et al., 2006d	Monitoring Plan	2-1-018:048; 2-1-035:001, 2-1-003, 2-1-004, 2-1-005, 2-1-006, 2-1-007, 2-1-008, - 2-1-008, 2-1-037:002	Queen's Medical Center
O'Leary and Hammatt, 2006a	Inventory Survey	2-1-009:011	Nu'uanu-Block J (Capital Place)
Perzinski, et al., 2000a	Inventory Survey	2-1-009:018	Nu'uanu-Block J
Perzinski, et al., 2005	Data Recovery	2-1-009:018	Nu'uanu-Block J
Simons, et al., 1991	Monitoring	2-1-017:001	Honolulu town
Tomonari-Tuggle, 1983	Assessment	2-1-009:018	Nu'uanu-Block J

Confluence of Waimanu Street, Kawaiaha'o Street, Queen Street, and Halekauila Street Alignments

Many routes (the Waimanu Street, Kawaiaha'o Street, Queen Street and Halekauila Street alignments) converge in a small area. To avoid repeating information pertinent to all of the alignments, this area is treated as a separate study node (see Table 4-15 and the following list of references).

This area has gained some prominence recently for the discovery of three cemeteries that appear to have been completely undocumented in the historic literature. These cemeteries were associated with the Wal-Mart, Queen Street Expansion, and Ko'olani Condominium projects. The presence of these cemeteries in a relatively small area does not necessarily mean that there are more in the vicinity. More detailed analysis may shed further light on the density and distribution of burials in this immediate area.

Table 4-16. Section V – Confluence of Waimanu Street, Kawaiaha'o Street, Queen Street and Halekauila Street Alignments

Source	Nature of Study	TMK	Location
Borthwick and Hammatt, 2006	Inventory Survey	2-3-005:013, 2-3-005:014, 2-3-005:015, 2-3-005:016, 2-3-005:017, 2-3-005:022, 2-3-005:023,	Ward Village
Bush and Hammatt, 2002a	Monitoring Plan	2-3-004, 2-3-005, 2-3-006:, 2-3-007	Kākā'āko ID-10
Bush, et al., 2005	Monitoring	2-3-004, 2-3-005, 2-3-006:, 2-3-007	Ko'olani Condo

Source	Nature of Study	TMK	Location
Chiogioji and Hammatt, 2003a	Monitoring Plan	2-3-002, 2-3-003	Kākā'āko, Kewalo
Chiogioji and Hammatt, 2003b	Monitoring Plan	2-3-004:073, 2-3-005:027, 2-3-006:014, 2-3-007:002	Kākā'āko, Kewalo
Chiogioji and Hammatt, 2003c	Monitoring Plan	2-3-005:001, 2-3-005:002, 2-3-005:003, 2-3-005:024, 2-3-005:026, 2-3-005:027	Kākā'āko, Kewalo
Davis and McGerty, 2002	Assessment	1-, 2-, 9-	Honolulu Rapid Transit Study
Esh and Hammatt, 2004a	Monitoring	2-3-006, 2-3-007, 2-3-010, 2-3-011, 2-3-012, 2-3-014, 2-3-015, 2-3-035, 2-3-038, 2-4-003, 2-4-004, 2-4-010, 2-4-012	Ala Moana
Ferrall, 1976	Geological Report	2-3-	Kākā'āko, Mō'ili'ili
Griffin, et al., 1987	Literature Review	2-1-, 2-1-029:001, 2-1-029:031:	Kākā'āko
Hammatt, 2006a	Monitoring Plan	2-3-005:013, 2-3-005:014, 2-3-005:015, 2-3-005:016, 2-3-005:017, 2-3-005:022, 2-3-005:023,	Ward Village
O'Leary and Hammatt, 2006b	Inventory Survey	2-3-003:072, 2-3-003:088, 2-3-003:102	Moana Vista
Souza, et al., 2002	Monitoring	2-1-058, 2-3-001, 2-3-002, 2-3-003, 2-3-004, 2-3-005	Kākā'āko ID-7
Tulchin and Hammatt, 2004	Literature Review	2-3-004, 2-3-005, 2-3-007, 2-3-009, 2-3-010, 2-3-013, 2-3-014, 2-3-017, 2-3-018, 2-3-022, 2-3-035, 2-3-036, 2-3-038	Kapi'olani
Tulchin and Hammatt, 2005	Inventory Survey Addendum	2-3-004:073, 2-3-005:027, 2-3-006:014, 2-3-007:002	Ko'olani Condo
Winieski and Hammatt, 2000b	Monitoring Plan	2-3-002:001	Kākā'āko-Ward Village
Winieski and Hammatt, 2000c	Monitoring	2-3-002:000, 2-3-003:000, 2-3-004:000, 2-3-005:000	Kākā'āko ID-4
Winieski and Hammatt, 2001b	Monitoring	2-3-002:001	Kākā'āko-Ward Village

Kona Street/University Avenue

The Kona Street/Kapi'olani Boulevard/University Avenue end is the common end segment for the alignments under consideration. This stretch passes through a pre-contact cultural landscape of fields and residences that was well populated and may contain burials and other cultural resources. The many limestone sinkholes in the area may have been used for a number of cultural practices. The relative paucity of archaeological studies, however (as shown in Table 4-16 and the following list of

references) suggests a significant decrease in anticipated finds from those segments to the west.

Table 4-17. Section V – Kona Street/University Avenue Previous Archaeological Studies

Source	Nature of Study	TMK [1]	Location
Athens, et al., 1994	Burial Report	2-3-039	Kewalo
Borthwick and Colin, 1995	Inventory Survey	2-3-035:001	Convention Center
Burgett and Rosendahl, 1993	Literature Review	2-7, 2-8, 2-9, 3-2, 3-3, 3-4	Mānoa, Pālolo-KP Trans
Burtchard, 1992a	Data Recovery Plan	2-8-029:001	Mānoa-Kānewai
Burtchard, 1992b	Data Recovery	2-8-029:001	Mānoa-Kānewai
Chafee and Spear, 1994	Assessment	2-7-009:013, 2-7-009:014, 2-7-010:008, 2-7-010:009	Mō'ili'i
Chiogioji and Hammatt, 2003a	Monitoring Plan	2-3-002, 2-3-003	Kākā'āko, Kewalo
Davis and McGerty, 2002	Assessment	1-, 2-, 9-	Hon. Rap. Tr.
Esh and Hammatt, 2004a	Monitoring	2-3-006, 2-3-007, 2-3-010, 2-3-011, 2-3-012, 2-3-014, 2-3-015, 2-3-035, 2-3-038, 2-4-003, 2-4-004, 2-4-010, 2-4-012	Ala Moana
Ferrall, 1976	Geological Report	2-3-	Kākā'āko, Mō'ili'i
Griffin, et al., 19878	Literature Review	2-1-, 2-1-029:001, 2-1-031	Kākā'āko
Hammatt and Chiogioji, 1993	Assessment	2-7-	Ala Wai Golf
Hammatt and Shideler, 1991	Burial Report	2-8-029:001	Manoa-Kānewai
Hammatt and Shideler, 1996	Data Recovery	2-3-035:001	Convention Center
Liston and Burtchard 1996	Assessment	2-8-029:001	Mānoa-Kānewai
Maly, et al., 1994	Assessment	2-3-035:, 2-3-036:018, 2-3-036:024, 2-3-036:025	Convention Center
O'Hare, et al., 2004a	Inventory Survey	2-3-004:073, 2-3-005:027, - 2-3006:014, 2-3-007:002	Ko'olani Condo
Schilz, 1991a	Literature Review	2-7-016, 2-7-017	Mō'ili'i
Smith, 1989	Burial Report	2-3-039:019	Kapi'olani
Wolforth, et al., 1996	Inventory Survey	2-7-, 2-8-, 2-9-, 3-2-, 3-3-, 3-4	Mānoa, Pālolo-KP Trans

Waikīkī Spur

This section reviews the extensive previous archaeological studies conducted in Waikīkī, focusing in particular on burials. Figure 4-12 shows the location of archaeological

studies in the vicinity of the Kūhiō Avenue Waikīkī Spur. These investigations are summarized in Table 4-17. Tax Map Key numbers are usually not added to this table, since information on the location of many burials, especially burials recorded by the Bishop Museum, is rather vague and the TMK is not known. Until the 1970s almost all of the documentation of burial finds in Waikīkī was in the records of the Bernice Pauahi Bishop Museum. This study draws upon information from an Inventory of Human Remains from the Island of O‘ahu in the possession of the Bishop Museum completed in accordance with NAGPRA (Bishop Museum “New Table” dated 3/15/2000) and a summation of museum holdings in the *Federal Register* (January 28, 1998, Volume 63, Number 18). Often the available information from this inventory is limited. More detailed information may be available through a more thorough investigation of museum records

Overview of Archaeological Research in Waikīkī

N.B. Emerson reported on the uncovering of human burials during the summer of 1901 on the property of James B. Castle – site of the present Elks Club – in Waikīkī during excavations for the laying of sewer pipes (Emerson, 1902:18-20). Emerson noted:

The soil was white coral sand mixed with coarse coral debris and sea-shells together with a slight admixture of red earth and perhaps an occasional trace of charcoal. The ground had been trenched to a depth of five or six feet, at about which level a large number of human bones were met with, mostly placed in separate groups apart from each other, as if each group formed the bones of a single skeleton. Many of the skulls and larger bones had been removed by the workmen before my arrival, especially the more perfect ones (Emerson, 1902:18).

Emerson’s report on the find describes the remains of at least four individuals, all presumed to be Hawaiian. Associated burial goods were also exposed during excavation; these included “a number of conical beads of whale-teeth such as the Hawaiians formerly made” and “a number of round glass beads of large size.” The glass beads “can be assigned with certainty to some date subsequent to the arrival of the white man” (Emerson, 1902:19). Also located with the beads was “a small sized *niho-palaoa*, such as was generally appropriated to the use of the chiefs” which had been “carved from the tooth of the sperm-whale” and which was “evidently of great age” (Emerson, 1902:19). Bishop Museum records show the curation of human remains from inadvertent discoveries at various locations in Waikīkī, with one of the earliest being human remains collected at San Souci Beach in 1927.

In the 1920s and 1930s the first systematic archaeological survey of O‘ahu was conducted by J.C. McAllister (1933). He recorded four *heiau*, three of which were located at the mauka reaches of Waikīkī *ahupua‘a* in lower Mānoa Valley. The fourth *heiau*, Papa‘ena‘ena, was located at the foot of Diamond Head crater and is traditionally associated with Kamehameha I, who was said to have visited the *heiau* before setting off to battle for Ni‘ihau and Kaua‘i in 1804 (‘Īī 1959:50-51). No *heiau* are believed to have been near the proposed Waikīkī Spur alignment.

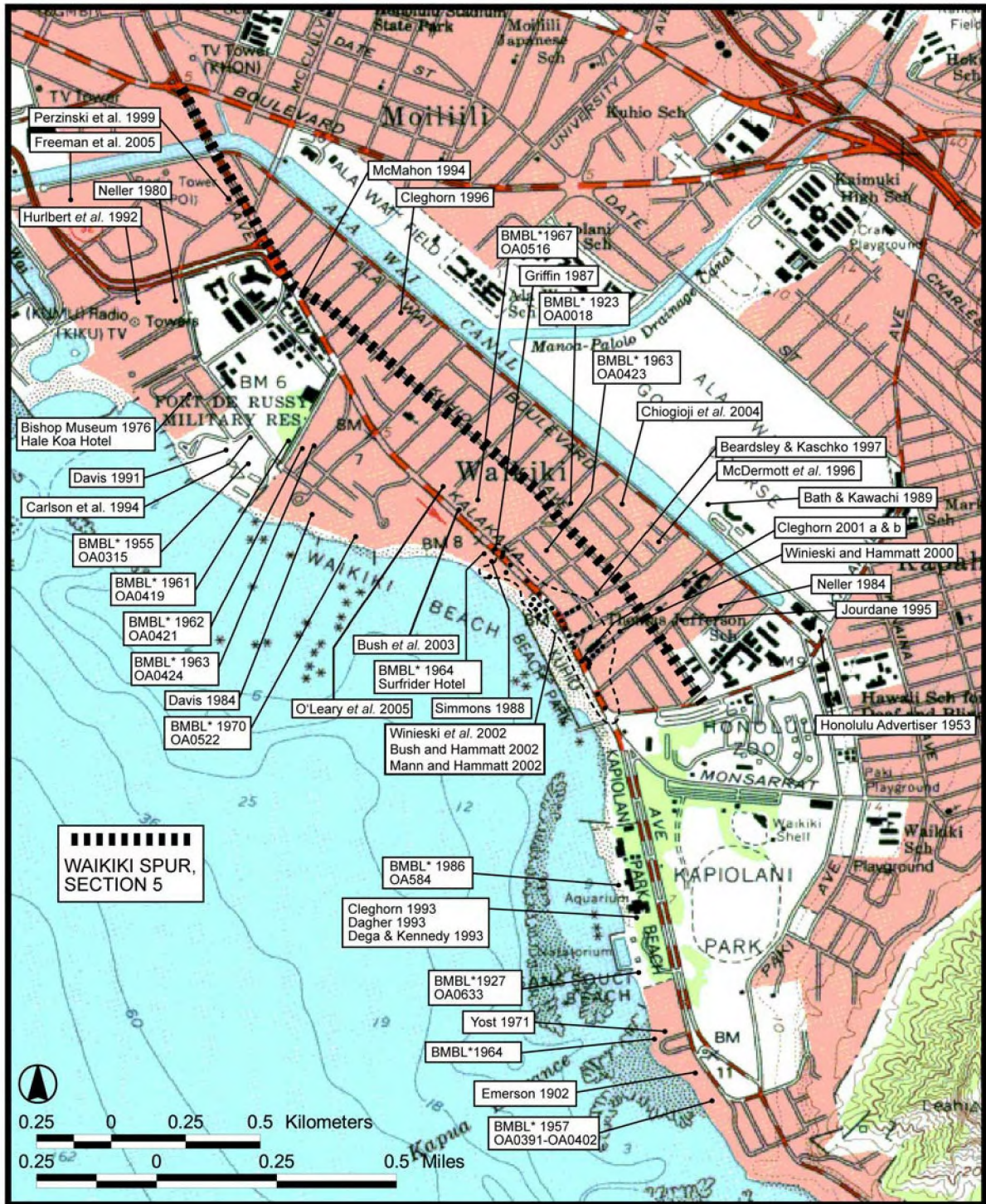


Figure 4-12. Archaeological Studies near Section V – Waikiki Spur (Kūhiō Avenue)

Table 4-18. Section V – Waikīkī Spur Previous Archaeological Investigations

Source	Nature of Study	Location	Findings
Athens, 1990	Letter	TMK: 2-6-023:025	Letter to SHPD listing human remains at IARII lab from Pacific Beach Hotel and Barbers Point Generating Station
Bath and Kawachi, 1989	Burial Recovery	Ala Wai Golf Course	Two burials
Beardsley and Kaschko, 1997	Monitoring and Data Recovery Report	Pacific Beach Hotel Office Annex	Traditional Hawaiian cultural deposits and two human burials; three ¹⁴ C dates; historic and pre-contact artifacts recovered
Bishop Museum, 2000 [1927]	“New Table” Burial List*	Just South of Natatorium OA0633	Collected by C.C. Hartwell at B.M.
Bishop Museum, 2000 [1964]	“New Table” Burial List	2431 Prince Edward Street OA 0462 and OA0463	Two human skulls and other human remains discovered in a construction trench
Bishop Museum, 2000 [1964]	“New Table” Burial List	Beach in front of Surfrider Hotel OA0464	Human burials revealed in sand due to erosion of beachfront donated by Lloyd J. Soehren
Bishop Museum, 2000 [1967]	“New Table” Burial List	International Market Place OA 0516	Donated by Lloyd J. Soehren
Bishop Museum, 1976	Burial List	Hale Koa Hotel	Six burials unearthed, five of apparent prehistoric age, and one of more recent date
Bishop Museum, 1981	Interim Progress Report on Testing, Excavations, and Monitoring	Halekūlani Hotel	Intact cultural deposits found
Bishop Museum, 2000 [1984]	Burial Remains List	Waikīkī Ahupua’a	Listing of burial remains in Waikīkī Ahupua’a at the Bishop Museum
Bishop Museum, 2000 [1986]	Burial List	“Queen’s Beach” just North of Aquarium	Donated to B.M. by Toni Han and Aki Sinoto
Borthwick, et al., 2002	Inventory Survey	71,000 sq. ft. parcel, TMK: 2-6-016:002	No burials encountered during testing; absence of dry Jaucus sand deposits indicate burial finds are unlikely in project area
Bush and Hammatt, 2002b	Monitoring	Kalākaua Avenue, between Ala Moana Boulevard and Kapahulu Avenue	Four human burials; analysis suggests pre-contact Native Hawaiians; several historic trash pits; entire pig within an <i>imu</i> pit (estimated date, A.D. 1641-1671); gleyed muck associated with former ponds
Bush, et al., 2003b	Monitoring	International Marketplace	Historic trash found

Source	Nature of Study	Location	Findings
Calis, 2002	Monitoring	Lemon Road	No historic deposits; major previous disturbance
Carlson, et al., 1994	Report of Human Remains	Kālia Road at Fort DeRussy	Approximately 40 human burials found, the majority from a communal burial feature
Chiogioji, 1991	Assessment	2 parcels, TMK 2-6-24:65-68 and 80-83, TMK 2-6-24:34-40 and 42-45	TMK 2-6-24:36-40, formerly a corner of the 'Āinahau estate; remainder of parcels, former 'auwai, kalo and rice fields; subsurface test excavations and specific sampling strategy recommended
Chiogioji, et al., 2004	Archaeological Inventory Survey	Tusitala Vista Apartments	Human remains encountered
Cleghorn, J., 1993	Report on Inadvertent Discovery of Remains	Waikīkī Aquarium	Remains of one human, mandible identified
Cleghorn P., 1996b	Inventory Survey	TMK: 2-6-016:23, 25, 26, 28, 61, 69	Seven backhoe trenches excavated; no sites located
Cleghorn, P., 2001a, b	Mitigation	Burger King Construction Site	Three incidents of uncovered human remains while locating buried sewer-line for the ABC's store
Corbin, 2001	Inventory Survey	Hilton Waikikian Property	No archaeological sites found during excavations of the area
Dagher, 1993	Report on Inadvertent Discovery	Waikīkī Aquarium	Human remains of at least one person identified, excavation recommended
Davis, 1984	Archaeological and Historical Investigation	Halekūlani Hotel	48 historic and prehistoric features excavated: six human burials recovered along with artifacts from both fire and trash pits
Davis, 1989	Reconnaissance Survey and Historical Research	Fort DeRussy	Fishponds and other features buried in this area. Sites -4573 thru -4577 are fishponds; -4570 is a remnant cultural deposit
Davis, 1991	Monitoring Report	Fort DeRussy	See also Davis, 1989. No groundwater contamination found; subsurface features and material remains date to early post-contact times (c. 1780s to 1790s) through the mid-19th century
Dega and Kennedy, 1993	Report on Inadvertent Discovery of Remains	Waikīkī Aquarium	Discovery of unidentified bone fragments; all remains turned over to SHPD

Source	Nature of Study	Location	Findings
Denham and Pantaleo, 1997a	Monitoring and Excavations Report	Fort DeRussy	Final Report does not include SHPD recommendations; 10 subsurface features and nine burial locations found. ¹⁴ C dates
Denham, et al., 1997	Data Recovery Report	Fort DeRussy	Excavations conducted at fishponds, ¹⁴ C dates mid-17th century
Elmore and Kennedy, 2001b	Burial Report	Royal Hawaiian Hotel	Human remains found during trench excavations for conduit. In situ remains left in place; disturbed remains re-entered with others
Elmore and Kennedy, 2002	Monitoring	Fort DeRussy	No findings
Emerson, 1902	Preliminary Report on Human Bones	James B. Castle Property: Site of present Elks Club	Human burials: skeletal remains from four individuals, glass beads, conical beads made of whale teeth, small carved <i>niho-palaoa</i>
Freeman, et al., 2005	Archaeological Inventory Survey	Kālia Waikīkī TMK 2-6-11	Burial encountered
Grant, 1996	Historical Reference	Waikīkī	Historical information about Waikīkī prior to 1900
Griffin, 1987	Burial Recovery Report	Along Kalākaua Avenue near the corner of Kaʻiulani Street	Bones removed and bagged by construction crew, burial found in <i>makai</i> wall of gas pipe excavation
Hammatt and Chiogioji, 1993	Archaeological Assessment	16-Acre portion of the Ala Wai Golf Course	Not associated with any known surface archaeological site; however, prehistoric and early historic occupation layers associated with <i>loʻi</i> system remain intact below modern fill. Specific sampling strategy and potential burial testing recommended.
Hammatt and Chiogioji, 1998c	Assessment	King Kalākaua Plaza Phase II	No surface archaeological sites, documented human burials, presence of subsurface cultural deposits (pre-contact Hawaiian and historic provenance)
Hammatt and Chiogioji, 2000b	Archaeological Assessment	Honolulu Zoo Parcel	Majority of zoo parcel unlikely to yield significant cultural deposits, but strong possibility of significant subsurface cultural deposits in the SW portion, and archaeological monitoring recommended in area
Hammatt and McDermott, 1999	Burial Disinterment Plan and Report	Kalākaua Avenue	Two human burials found
Hammatt and Shideler, 1995	Sub-surface Inventory Surface	Hawaiʻi Convention Center Site, 1777 Kalākaua Avenue	No further work recommended

Source	Nature of Study	Location	Findings
Hammatt and Shideler, 1996	Data Recovery	Hawai'i Convention Center Site	No clear evidence that Kūwili Pond sediments present in project area; no further work recommended
Hurlbett, et al., 1992	Monitoring	TMK: 2-6-008:001	Site -2870 assigned to three burials found by Neller in 1980b
Hurst, 1990	Historical Literature Search	Waikikian Hotel	Background and planning document; no fieldwork conducted
Jourdane, 1995b	Report of Inadvertent Discovery of Human Remains	Paoakalani Avenue	Human skeletal remains discovered in planted strip between street and sidewalk fronting hotel
Kennedy, 1991b	Monitoring Report	TMK: 2-6-022:014 IMAX theater location	Pollen and bulk-sediment ¹⁴ C samples from ponded sediments were recovered. The three ¹⁴ C dates and the pollen sequence were interpreted as inverted
LeSuer, et al., 2000	Inventory Survey	King Kalākaua Plaza Phase II	Site -5796 has been adversely affected by land alteration of the project area; Site -4970, has been adequately documented
Maly, et al., 1994	Archaeological and Historical Assessment Study	Convention Center Project Area	Recommend subsurface testing to determine presence or absence of cultural deposits and features
McAllister, 1933	Island-wide survey	All of O'ahu	Waikīkī listed as Site 60
McDermott, et al., 1996	Inventory Survey	'Āinahau Estate	Buried remnants of 'auwai and lo'i and human burial found on grounds of 'Āinahau Estate, ¹⁴ C dates
McGuire and Hammatt, 2001	Cultural Assessment	Along Lewers Street, Beach Walk, Kālia Road and Saratoga Road. Proposed Waikīkī Beach Walk project (Outrigger properties renovations)	Primary cultural concern identified as inadvertent burial discovery. Cultural monitoring recommended for all subsurface work within project area
McMahon, 1994	SHPD Burial Report	Intersection of Kalākaua and Kuamo'o Streets	Inadvertent Burial Discovery: misc. bones uncovered in back dirt pile during construction. Follow up by CSH
Mann and Hammatt, 2002b	Monitoring	Lili'uokalani Avenue and Uluniu Avenue	Five burial finds of six individuals; two historic trash pits
Nakamura, 1979	History Graduate Thesis	Waikīkī	History of Waikīkī with focus on radical changes in land use that occurred in the early 20th century
Neller, 1980b	Monitoring	Kālia Burial Site: Hilton Hawaiian Village	Brief field inspection: partial recovery of three historic Hawaiian burials, trash pit from 1890s, no prehistoric Hawaiian sites

Source	Nature of Study	Location	Findings
Neller, 1981	Survey	Halekūlani Hotel	Limited background research on area
Neller, 1984	Informal Narrative Report	Lili'uokalani Gardens condominium, originally Queen Lili'uokalani's 19th century bungalow	Recovery of seven human burials and historic and pre-contact artifacts at construction site
O'Leary, et al., 2005	Archaeological Inventory Survey	2284 Kalākaua (former Waikīkī 3 Theater parcel)	Burial encountered
Perzinski and Hammatt, 2001a	Monitoring	Kapi'olani Bandstand	A charcoal layer was observed, more concentrated on the SW portion; recovered indigenous artifact, basalt lamp with handle, from SE end of bandstand
Perzinski and Hammatt, 2001b	Monitoring	Kapi'olani Park	No cultural layer, artifacts, midden or human burials encountered during excavations
Perzinski and Hammatt, 2001c	Monitoring	Kalākaua Avenue from the Natatorium to Poni Mo'i Road	No cultural layer, artifacts, midden or human burials encountered during excavations.
Perzinski, et al., 1999	Monitoring Report	Along portions of Ala Wai Boulevard, Kalākaua Avenue, Ala Moana Boulevard, and 'Ena Road	Two human burials found (one preceding monitoring); pockets of undisturbed layers still exist; burial no. 2 previously disturbed
Perzinski, et al., 2000b	Burial Findings	Kalākaua Avenue between Kai'ulani and Monsarrat Avenues	44 sets of human remains; 37 disinterred, seven left in place; believed to be Native Hawaiian, prior to 1820
Pietrusewsky, 1992a	PA Report	Moana Hotel	Right half of human mandible found by hotel guest
Pietrusewsky, 1992b	PA Report	Lili'uokalani Gardens Site, Hamohamo	Human remains from the Lili'uokalani Gardens Site, Hamohamo, Waikīkī, O'ahu
Putzi and Cleghorn, 2002	Monitoring	Hilton Hawaiian Village	No findings during monitoring of trench excavations for sewer connections
Riford, 1989	Pre-Field Background Literature Search	TMK: 2-6-014:039	List of literature pertaining to Waikīkī area
Rosendahl, 1989	Inventory Survey, Preliminary Report	Fort DeRussy	Historic artifacts, no human remains
Rosendahl, 1992	Monitoring Report	Hilton Hawaiian Village	Identified 12 historic refuse pits, three historic to modern trenches; not recommended for further work, significant only for informational content
Rosendahl, 1999	Interim Report: Inventory Survey	Fort DeRussy	This area is part of the old shoreline

Source	Nature of Study	Location	Findings
Rosendahl, 2001	Assessment	Outrigger Beach Walk	Assessment of previous historical and archaeological literature
SHPD, 1987	Burial Report	Kalākaua Avenue	From excavation adjacent to Moana Hotel (site -9901)
SHPD, 1991	Public Inquiry	TMK: 2-6-024:036	Bones determined to be non-human and part of the extensive fill material present in the area
Simons, 1988	Interim Field Study, Monitoring and Data Recovery	Moana Hotel Area	Human skeletal remains, burials, preliminary osteological analysis indicates pre-contact type; artifactual material recovered, both pre- and post-contact types
Simons et al., 1995	Data Recovery Excavations	Fort DeRussy	Seven occupational layers, six prehistoric cultural features: 'auwai bunds and channels, fishpond walls and sediments, possible lo'i, and hearths
Streck, 1992	Memorandum for Record	Fort DeRussy	Human burial discovery (believed to be late prehistoric Hawaiian) during data recovery excavations, May, 20, 1992
Tome and Dega, 2003	Monitoring	Waikīkī Marriot	No in situ remains; monitoring recommended if more work to be done; one isolated not in situ possible human bone fragment
Tulchin and Hammatt, 2003	Archaeological and Cultural Impact Assessment	2284 Kalākaua Avenue	Notes possibility of burials within project area; recommends inventory survey with subsurface testing
Winieski and Hammatt, 2000d	Monitoring	TMK: 1-2-6-025:000	The possibility exists that Hawaiian or historic materials and human burials may still be present within the project area
Winieski, et al., 2002a	Monitoring	Kalākaua Avenue between Ka'iulani and Monsarrat Avenues	44 human burials encountered, 37 disinterred; buried habitation layer contained traditional Hawaiian artifacts, midden, hearths, fire pits, and charcoal concentrations; fragment of light gauge rail, remnant of Honolulu Transit trolley system, observed; also low energy alluvial sediments associated with now channelized <i>muliwai</i> Kukaunahi
Winieski, et al., 2002b	Monitoring	Kūhiō Beach	Skeletal remains of 10 individuals, six disinterred, only two in situ. Four indigenous artifacts, none in situ. Discontinuous cultural layer, historic seawall

* The “New Table” Burial List is a listing of the Bishop Museum acquisitions of human remains in the possession of Cultural Surveys Hawai‘i dated 3/15/2000 that gives a short summary of place of acquisition, collection history and source. Dates in brackets indicate original date of identification of remains.

The era of salvage archaeology in Waikīkī commenced with the Bishop Museum’s 1961 excavations on Saratoga Road when human remains were encountered during construction.

In 1963 the Bishop Museum excavated multiple burials during construction of the present Outrigger Canoe Club at the Diamond Head end of Kalākaua Avenue. A total of 27 burials were encountered, although apparently no formal archaeological report on the burials was produced (Yost, 1971: 28). As reported in a newspaper article on Jan. 24, 1963, The Outrigger Canoe Club dedicated its new site on land adjacent to and leased from the Elks Club, an ancient Hawaiian burial ground in Waikīkī:

Robert Bowen of the Bishop Museum has been working closely with Ernest Souza, Hawaiian Dredging superintendent, on the removal of skeletons unearthed on the site, between the Colony Surf and the Elks Club...

Most of the bodies were buried in the traditional ho‘olewa position, with the legs bound tightly against the chest.

One of the skeletons, Bowen said, shows evidence of a successful amputation of the lower forearm, indicating that the Hawaiians knew this kind of operation before the arrival of Europeans.

The ages of the skeletons ranged from children to 40-year-old men and women. The average life span of the Hawaiians at the time was about 32 years (*Honolulu Star-Bulletin*; Jan. 24, 1963: 1A)

In 1963, two human skulls and other human remains were discovered in a construction trench at 2431 Prince Edward St. (Bishop Museum site Oa-A4-23, cited in Neller, 1984).

In 1964, sand dune burials, a traditional Hawaiian mortuary practice, were revealed as beach sand eroded on the site of the Surfrider Hotel (Bishop Museum Site files).

In 1964, human remains of four individuals from Waikīkī, O‘ahu were collected and donated to the Bishop Museum by Lloyd J. Soehren. In 1967, Soehren collected and donated to the Bishop Museum the human remains of one individual from Waikīkī. The one associated funerary object is a shell (Bishop Museum Site files).

Bishop Museum records indicate that Lloyd J. Soehren recovered human remains in 1967 during construction of the “Tahiti by Six” restaurant at International Market Place.

Few archaeological reports were conducted in Waikīkī during the 1970s. In 1976, during construction of the Hale Koa Hotel, adjacent to the Hilton Hawaiian Village Hotel, six burials were unearthed, five of apparent prehistoric or early historic age and one of more recent date (Bishop Museum Site files). In 1977 Sinoto conducted a reconnaissance

survey on the grounds of the Hilton Hotel. No surface features were identified, although it was recommended that construction work be monitored owing to the possibility that subsurface cultural deposits would be encountered. A third report (Rogers-Jourdane, 1978) describes a surface reconnaissance at the site of the Halekūlani Hotel. No cultural resources were encountered; however, it was recommended that construction be monitored in the event buried cultural deposits were present.

In 1980, three burials were exposed at the Hilton Hawaiian Village during construction of the hotel's Tapa Tower. Earl Neller of the (then named) State Historic Preservation Program was called in upon discovery of the burials and conducted fieldwork limited to three brief inspections of the project area. Neller's (1980b) report noted, "The bones from three Hawaiian burials were partially recovered; one belonged to a young adult male, one a young adult female, and one was represented by a single bone." Neller also documented the presence of trash pits, including one from the 1890s, which contained "a large percentage of luxury items, including porcelain tablewares imported from China, Japan, the United States, and Europe" (Neller, 1980b:5). He further noted the importance of "dateable trash deposits related to the different ethnic and social groups that occupied Waikīkī over the last 200 years" (Neller, 1980b: 5).

Between December 1981 and February 1982, archaeologists from the Bishop Museum led by Bertell Davis conducted a program of excavations and monitoring during construction of the new Halekūlani Hotel (Davis, 1984). Six human burials were recovered along with "animal burials [and] cultural refuse from prehistoric Hawaiian fire pits, and a large collection of bottles, ceramics, and other materials from trash pits and privies dating to the late 19th century" (Davis, 1984:i).

In 1983, at the Lili'uokalani Gardens condominium construction site, seven traditional Hawaiian burials were recovered (Neller, 1984). This had been the site of a bungalow owned by Queen Lili'uokalani at the end of the 19th century. In addition to the burials, the site contained plentiful historic artifacts and a pre-historic cultural layer pre-dating the burials.

During 1985 and 1986, archaeologists from Paul H. Rosendahl, Ph. D. Inc. conducted archaeological monitoring at the site of the Mechanical Loop Project at the Hilton Hawaiian Village, Waikīkī. Much of this project area was disturbed by historic and modern construction and modification. Fifteen subsurface features were uncovered during monitoring, all of which were determined to be historic trash pits or trenches. The dating of these features was based on the artifactual material they contained. All 15 features are thought to post-date 1881 based on this artifact analysis. The three partial burials reported by Neller (1980b) were found within this project area. No further burials were encountered during the fieldwork (Hurlbert, et al., 1992).

In 1985, International Archaeological Research Institute, Inc. performed archaeological monitoring and data recovery at the Pacific Beach Hotel Office Annex (Beardsley and Kaschko, 1997). Two traditional Hawaiian burials were discovered and removed. Intact buried traditional Hawaiian cultural deposits, including a late pre-contact habitation layer, contained pits, fire pits, post molds, artifacts, and food debris. The artifacts included

basalt and volcanic glass flakes and cores, a basalt adze and adze fragments, worked pearl shells, a coral file and abraders, and a pearl shell fishhook fragment. Additionally, a late 19th-century trash pit was discovered, which contained a variety of ceramics, bottles, and other materials.

In 1987, a human burial was discovered and removed at the intersection of Kalākaua Avenue and Ka‘iulani Street during excavations for a gas pipe fronting the Moana Hotel (Griffin, 1987).

In 1988, the Moana Hotel Historical Rehabilitation Project (Simmons, 1988) encountered human remains from at least 17 individuals. Based on stratigraphic association these burials were interred over time as the landform at the site changed. The sediment surrounding these burials yielded traditional midden and artifact assemblages. The burials and human remains were found in the Banyan Court and beneath the hotel itself.

Davis’ (1989, 1991) excavation and monitoring work at Fort DeRussy documented substantial subsurface archaeological deposits, prehistoric, historic, and modern. These deposits included buried fishpond sediments, ‘*auwai* (irrigation ditch) sediments, midden, artifact-enriched sediments, structural remains such as post holes and fire pits, historic trash pits, and a human burial. Davis’ (1991) report documents human activity in the Fort DeRussy beach front area from the 16th century to the present.

The work at Fort DeRussy continued in 1992 when BioSystems researchers built upon Davis’ work (Simons, et al., 1995). BioSystems research documents the development and expansion of the fishpond and ‘*auwai* system in this area. The ‘*auwai* system was entered on the State Inventory of Historic Places (SIHP) as State Site 50-80-14-4970. Remains of the fishpond and ‘*auwai* deposits, as well as habitation deposits, were documented below modern fill deposits. This research, along with that of Davis (1991), clearly demonstrates that historical document research can be an effective guide to locating late pre-contact/early historic subsurface deposits, even amidst the development of Waikīkī.

In 1992, Hurlbett, et al., (1992) conducted additional monitoring and testing in the same area as Neller (1980b). The state site -2870 was given to the three burials first found by Neller. Additional subsurface features, postdating 1881, were found during trenching operations.

The realignment of Kālia Road at Fort DeRussy in 1993 uncovered approximately 40 human burials. A large majority of these remains were recovered in a large communal burial feature (Carlson, et. al., 1994). The monitoring and excavations associated with this realignment uncovered a cultural-enriched layer that contained post holes.

In 1993, during construction activities at Waikīkī Aquarium, fragmentary human remains were discovered scattered in a back dirt pile, although no burial pit was identified (Dega and Kennedy, 1993).

On April 28, 1994, an inadvertent burial discovery was made during excavation for a water line at the intersection of Kalākaua Avenue and Kuamo‘o Street (just *mauka* of Fort DeRussy). These remains represented a single individual (McMahon, 1994).

In 1995, the remains of one individual were discovered in situ during construction activities on Paoakalani Street, fronting the Waikīkī Sunset Hotel (Jourdan, 1995b).

In 1996, a traditional Hawaiian burial was discovered and left in place during test excavations on two lots at Lili‘uokalani Avenue and Tusitala Street (McDermott, et al., 1996). Indigenous Hawaiian artifacts and historic artifacts were also found.

In 1996, Pacific Legacy, Inc. conducted an archaeological inventory survey of the block bounded by Kalākaua Avenue, Kūhiō Avenue, ‘Ōlohana Street, and Kālainmoku Street (Cleghorn, 1996b). The survey included excavation of seven backhoe trenches. The subsurface testing indicated that:

. . . this area was extremely wet and probably marshy. This type of environment was not conducive for traditional economic practices. . . The current project area appears to have been unused because it was too wet and marshy. Several peat deposits, containing the preserved remains of organic plant materials were discovered and sampled. These deposits have the potential to add to our knowledge of the paleoenvironment of the area [Cleghorn, 1996b:15].

The report concluded that no further archaeological investigations of the parcel were warranted since “no potentially significant traditional sites or deposits were found,” but cautioned of the “possibility, however remote in this instance, that human burials may be encountered during large scale excavations” (Cleghorn, 1996b:15).

In 1997, during archaeological monitoring by CSH for the Waikīkī Force Main Replacement Project, scattered human bones were encountered on ‘Ōhūa Street (Winieski and Hammatt, 2000d). These included the proximal end and mid-shaft of a human tibia, a patella, and the distal end and mid-shaft of a femur. No precise location for the original burial site was identified.

In April 1999, two human burials were inadvertently encountered near the intersection of Ena Road and Kalākaua Avenue during excavation for the first phase of the Waikīkī Anti-Crime Lighting Improvements Project (Perzinski, et al., 1999).

From July 1999 to October 2000, four sets of human remains were inadvertently encountered during excavation activities for the Waikīkī Anti-Crime Street Lighting Improvement Project along portions of Kalākaua Avenue (Bush, et al., 2002b).

From November 1999 to May 2000, 44 human burials with associated cultural deposits were encountered during excavation for a waterline project on Kalākaua Avenue between Ka‘iulani and ‘Ōhūa Avenues (Winieski, et al., 2002a). Except for previously disturbed partial burials located in fill materials, the bulk of the burials were encountered within a coralline sand matrix. Additionally, a major cultural layer was found and documented.

From January 2000, to October 2000, 10 human burials were encountered during archaeological monitoring of the Kūhiō Beach Extension/Kalākaua Promenade Project (Winieski, et al., 2002b). Six of these were within a coralline sand matrix. The four others were partial and previously disturbed within fill. Additionally, a major cultural layer was found and documented, apparently part of the same major cultural layer associated with the waterline project between Kaʻiulani and ʻŌhūa Avenues.

In April 2001 human remains were inadvertently disturbed during excavations associated with construction of a spa at the Royal Hawaiian Hotel (Elmore and Kennedy, 2001b). Archaeological Consultants of the Pacific, Inc documented the remainder of the burial and carrying out the instruction of the Department of Land and Natural Resources (DLNR) and SHPD. The burial and place it was encountered was assigned State Site # 50-80-14-5937. The associated artifacts included one shell button found in situ and three other shell buttons found in the disturbed material. A single drilled dog tooth was also found during excavation but could not be positively associated with the site.

On May 2 and June 14, 2001, two in situ and two previously disturbed human burials were encountered at the site of a new Burger King (Cleghorn, 2001a) and an adjoining ABC Store (Cleghorn, 2001b). The finds were at the intersection of ʻŌhūa Street and Kalākaua Avenue. Because of their proximity to five burials encountered during the Kalākaua 16-inch Water Main Installation (Winieski, et al., 2002a), they were included in the previously assigned State Site 50-80-14-5861. Three of these burials were recovered, and one was left in place. Volcanic glass fragments were found in association with one of the burials. A cultural layer was also observed that contained moderate-to-heavy concentrations of charcoal and fragments of volcanic glass. Historic-era artifacts, including a bottle fragment, plastic and glass buttons, a ceramic fragment, and metal fragments, were also encountered within fill materials.

In 2001 and 2002, during archaeological monitoring on Uluniu and Liliʻuokalani Avenues, five burial finds, consisting of six individuals, were recorded (Mann and Hammatt, 2002b). Four burial finds were recorded on Uluniu Avenue; three of these inadvertent finds were found in fill sediment. Because the three burial finds in fill had been previously disturbed, it was concluded that no state site number(s) would be assigned. The only primary in situ burial encountered on Uluniu Avenue was assigned State Site #50-80-14-6369. The fifth burial, consisting of two individuals in fill material, was recorded from Liliʻuokalani Avenue. Since three burials had been found in the immediate vicinity during a previous project (Winieski, et al., 2002b) and had been assigned to Site #50-80-14-5859, the two new individuals were recorded as Feature H of this previously recorded site.

A recent archaeological inventory survey (Chiogioji, et al., 2004) for a 1.03-acre parcel of land bounded by Ala Wai Boulevard to the northeast and Tusitala Street to the southwest identified four sites, including a buried A Horizon relating to ʻĀinahau (Cleghorn Estate) and human skeletal fragments in disturbed sediment.

Another recent archaeological inventory survey (O’Leary, et al., 2005) at the location of the former Waikīkī 3 Theater on Kalākaua Avenue documented a single in situ articulated burial

Summary of Previous Research in Waikīkī

The *ahupua‘a* of Waikīkī, in the centuries before the arrival of Europeans, was an intensely used area with abundant natural and cultivated resources that supported a large population. After a period of depopulation in the 19th and early 20th centuries, Waikīkī was reanimated by Hawaiians and foreigners residing there, and by farmers continuing to work the irrigated field system, which had been converted from taro to rice. Farming continued until construction of the Ala Wai Canal drained the remaining ponds and irrigated fields. Remnants of the pre-contact and historical occupation of Waikīkī have been discovered and recorded in archaeological reports, usually in connection with construction activities related to urban development or infrastructure improvements. These discoveries, which have occurred throughout Waikīkī, have included many human burials and cultural deposits, traditional Hawaiian and historic.

The abundance of burials and cultural deposits in the vicinity of the Waikīkī Spur makes inadvertent finds during subsurface excavation likely. During monitoring, agricultural and aquacultural features, as well as habitation loci, could be expected (Chaffee and Spear, 2004), and human remains and intact or disturbed cultural deposits could also be found.

In summary, past archaeological research, from the beginning of the 20th century to the present, has produced evidence that traditional Hawaiian cultural deposits, historic trash deposits, and, most notably, human burials, do exist throughout the breadth of the Waikīkī area.

Results of previous archaeological research in adjacent areas of Waikīkī have revealed a high frequency of burials and cultural deposits. Several archaeological deposits and sets of human remains have been discovered near the proposed Kūhiō Avenue Waikīkī Spur. The greatest abundance of these burials is to the west and south near Kalākaua Avenue, but the density and distribution of burials along Kūhiō Avenue is not altogether clear.

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Cultural Surveys Hawai‘i, Inc., has compiled a substantial amount of archaeological information for the transit corridor to provide the most accurate assessment of potential impacts to archaeological resources for each of the alternatives. As discussed in Chapter 3, Methods, and Chapter 4, Affected Environment, this information includes USGS soils survey data, previous archaeological investigation results, previously recorded archaeological sites, historic land records, and previously recorded burial locations. Specifically for the impacts analysis, this information has been compiled into a single ArcGIS map document as a means of synthesizing the different information types. There are 28 maps associated with Alternative 3 and 76 maps associated with Alternative 4. These maps, in PDF format, are included as Appendix A to this report.

Although this compiled archaeological information for the transit corridor is extensive, it is not a complete synthesis of all available data sets (e.g., all previous archaeological reports, archaeological site records, or Land Commission Award (LCA) records from the mid-19th century *Māhele* that pertain to the transit corridor). Nevertheless, this information is a valuable means for assessing potential impacts to archaeological resources, with the focus being on the different alignments for Alternative 3, Managed Lanes and Alternative 4, Fixed Guideway.

Displayed graphically, this information makes it easy to compare likely archaeological impacts for different alignments. To display this information at a scale that is readable and meaningful, however, 33 “map areas” are needed to cover the approximately 23-mile-long transit corridor. Each of these 33 map areas requires several different sheets to display different archaeological information, such as soils and previous archaeological investigations. As a result, approximately 100, 11-x-17-inch map sheets are necessary to display this information at a readable scale. This type of graphic-heavy documentation is unwieldy and difficult to present. As a compromise these graphic representations are included in PDF format as a compact disc appendix to this report. This detailed archaeological information is the basis for the following discussion of archaeological impacts.

As discussed below, Alternative 1, No Build, and Alternative 2, Transportation System Management, may involve construction that could impact archaeological resources; however, these impacts are not considered in this AA because these alternatives would undergo a separate environmental review as part of their planning and implementation. Accordingly, the following discussion of archaeological impacts will focus on Alternatives 3 and 4 only.

With few exceptions, the archaeological resources that could be affected by the Alternative 3 and 4 alignments are subsurface features and deposits that have not been previously identified. Such impacts would occur during construction. Once negative impacts from construction (e.g., archaeological resource destruction) and positive impacts from construction (e.g., an increase in archaeological knowledge about O‘ahu’s south

shore) have occurred, no long-term project-related impacts are expected on archaeological resources.

Three general categories of archaeological resource impacts are used in the following discussion: burials, pre-contact archaeology, and historic archaeology. Burials include pre-contact and traditional Hawaiian interments, as well as historic burials. Under both federal and Hawai‘i historic preservation law, burials are treated as a unique type of archaeological/cultural resource. Disarticulated, previously disturbed human remains are by definition “burial sites” under Hawai‘i law (Hawai‘i Revised Statutes Chapter 13-300-2). Accordingly, potential impacts to burials and burial sites are discussed.

Pre-contact archaeological resources include the physical remains of past pre-contact land use, for example, artifacts, food remains, and features, such as postholes, hearths, and structural remains. Structural remnants include fishponds, irrigated pond fields, and irrigation ditches. Also included in the pre-contact archaeological remains category are paleoenvironmentally informative sedimentary deposits that can provide data on human-induced environmental change over time. These types of sediments are often found in low-energy alluvial deposits, such as ponds, marshes, and tidal flats.

Historic archaeological resources are those that accumulated after the arrival of Captain James Cook in 1778, when the first known records of Hawai‘i were written. This includes historic building and structure remnants, trash pits, and remnants of transportation and agricultural infrastructure.

Each of the Alternative 3 and 4 alignments are rated, low, medium, or high based on their potential impact to each of the three archaeological impact categories. These were developed using the entire geographic extent of each of the proposed alignments as the unit of consideration.

Ratings are based on the reasonable expectation of potential impacts along a percentage of the length of each of the proposed alignments. A low rating indicates potential impacts are possible, but not considered likely, or that there is a reasonable expectation of potential impacts along no more than 10 percent of a given alignment’s length. A medium rating indicates that there is reasonable potential for impacts between 10 and 50 percent of the alignment’s length. A high potential rating indicates a reasonable expectation of potential impacts along more than 50 percent of an alignment’s length. A high rating, however, does not mean that, based on background archaeological research, at least 50 percent of a proposed alignment will encounter archaeological deposits. Rather such a ratings only means that, based on archaeological research, there is a reasonable potential to encounter archaeological deposits over at least 50 percent of the proposed alignment’s length. The actual percentage of the proposed alignment’s length where archaeological resources are encountered will undoubtedly be small.

One overwhelming generalization became clear as a result of this impact analysis: the farther inland an alignment is, the less likely it is to have potential impacts on archaeological resources. This generalization is reflected in the following archaeological resource impacts discussion.

Table 5-1, below, summarizes the potential archaeological impacts by alignment for each alternative. For Alternatives 3 and 4, additional tables follow for each alignment that summarize previous archaeological investigations and previously recorded archaeological sites pertinent to each alignment. These tables illustrate which alignments have had the most archaeological work in their vicinity. A lack of previous archaeological work in the vicinity of an alignment, however, should not be interpreted as a low potential for impacts to archaeological resources. Rather, it means that other proxy data sets, such as soils and 19th-century land documents, need to be considered for that area.

Table 5-1. Summary of Potential Impacts to Archaeological Resources

Alternative	Burials	Pre-contact Archaeology	Historic Archaeology
Alternative 1: No Build Alternative			
No Build Alternative	N/A	N/A	N/A
Alternative 2: TSM Alternative			
TSM Alternative	N/A	N/A	N/A
Alternative 3: Managed Lane Alternative (by section)			
3a. Two-Direction Option			
Waiawa IC to Hālawā Stream	Low	Medium	Medium
Hālawā Stream to Pacific Street	Medium	Medium	Medium
3b. Reversible Option			
Waiawa IC to Hālawā Stream	Low	Medium	Medium
Hālawā Stream to Pacific Street	Medium	Medium	Medium
Alternative 4: Fixed Guideway Alternative (by section)			
I. Kapolei to Fort Weaver Road			
Kamokila Boulevard/Farrington Highway	Low	Low	Low
Kapolei Parkway/North-South Road	Low	Low	Low
Saratoga Avenue/North-South Road	Low	Low	Low
Geiger Road/Fort Weaver Road	Low	Medium	Low
II. Fort Weaver Road to Aloha Stadium			
Farrington Highway/Kamehameha Highway	Low	Medium	Medium
III. Aloha Stadium to Middle Street			
Salt Lake Boulevard	Low	Low	Low
Mauka of the Airport Viaduct	Low	Medium	Medium
Makai of the Airport Viaduct	Low	Medium	Medium
Aolele Street	Low	Medium	Medium
IV. Middle Street to Iwilei			
North King Street	Medium	Medium	Medium
Dillingham Boulevard	Medium	Medium	Medium
V. Iwilei to UH Mānoa			
Beretania Street/South King Street	Medium	Medium	Medium
Hotel Street/Waimanu Street/Kapi'olani Boulevard	High	High	High
Hotel Street/Kawaiaha'o Street/Kapi'olani Boulevard	High	High	High
Nimitz Highway/Queen Street/Kapi'olani Boulevard	High	High	High
Nimitz Highway/Halekauwila Street/Kapi'olani Boulevard	High	High	High
Waikikī Spur	High	High	High

Alternative 1: No Build

Although the No Build Alternative (see Chapter 1) assumes completion of projects defined in the O‘ahu 2030 Regional Transportation Plan (RTP), no construction would be undertaken as part of this project. Impacts associated with development of the individual projects listed in the RTP are not detailed in this evaluation because the projects will undergo planning and environmental review as part of their individual project development process.

For the reasons stated above, Alternative 1 was not assessed for impacts to archaeological resources.

Alternative 2: Transportation System Management

As with Alternative 1, potential archaeological impacts for Alternative 2 were not assessed.

Alternative 3: Managed Lane

Alternative 3a: Two-Direction Option

In rating archaeological impacts, there are no differences between Alternative 3a, the two-direction option, and Alternative 3b, the reversible option. Tables 5-2 and 5-3 apply to both alternatives.

For the most part, Alternative 3 would traverse some of the same alignments as Sections I through IV of Alternative 4. Alternative 3 may result in fewer impacts on cultural resources and burials than Alternative 4. Any associated ground disturbance would confront the same likelihood of encountering cultural resources or burials.

Waiawa IC to Hālawā Stream

The managed lanes in this section traverse the same alignment as Sections 2 and 3 of Alternative 4. Little archaeological research has been conducted in this area. Only a few burials have been reported, and these are primarily near the shores of Pearl Harbor. In pre-contact and early historic times, much of the area *makai* of the alignment was covered with fishponds. In the later historic period, features associated with the cultivation of sugar cane, especially plantation worker’s camps, were built mauka of the alignment. For this section of Alternatives 3a and 3b, the potential to impact burials is rated as low, and the potential to impact archaeological and historical resources is rated as medium.

Table 5-2. Waiawa IC to Hālawā Stream

Author	Nature of Study	Location (TMK 1-)	Sites
Barrera, 1971	Inventory Survey	Aloha Stadium, Hālawā (TMK 9-9-003:061)	No sites, notes massive land modification
Chafee and Anderson, 1995	Burial Report	Waiawa Road, Waiawa Ahupua‘a (TMK 9-6-003:005)	50-80-09-5302 (one burial)

Author	Nature of Study	Location (TMK 1-)	Sites
Dega and O'Rourke, 2003	Evaluation	Pearl City (TMK 9-8-007:001; 9-9-006:020)	None
Dye, 1999	Archaeological Resources Survey	Hālawā Bridge, Hālawā (TMK 9-9-001:001; 9-9-002:004; 9-9-003:026, 9-9-003:029, 9-9-003:056)	No sites found during survey; fill material present
Fong, et al., 2005	Literature Review and Field Inspection	13-acre Mānana Parcel B, Waiawa and Mānana (TMK 9-7-024:057)	None
Goodman and Nees, 1991	Reconnaissance /Inventory Survey	Waiawa (TMK 9-4-006:011, 9-4-026; 9-6-004:001, 9-6-004:004, 9-6-004:016; 9-6-005:001 to :014)	50-80-09-1470 (historic dump); 50-80-09-1471 (pineapple cannery building); 50-80-09-1472 (camp #3); 50-80-09-2261 (rock alignment); 50-80-09-2262 (lithic scatter); 50-80-09-2263 (rockshelter); 50-80-09-2264 (trail); 50-80-09-2265 (six rock mounds); 50-80-09-2266 (terrace/depression); 50-80-09-2267 (terrace); 50-80-09-2268 (Waiāhole Ditch); 50-80-09-2269 (Ahren's Ditch) 50-80-09-2270 (road/railway system) 50-80-09-1469 (historic road features); 50-80-09-2271 (historic grave); 50-80-09-2272 (military areas); 50-80-09-2273 (irrigation complex)
Hammatt and Borthwick, 1985	Reconnaissance Survey	37-acre wetland parcel, Waiawa (TMK 9-6-003:025, 9-6-003:026, 9-6-003:027, 9-6-003:028)	No site number for wetland designated; notes rich cultural history of area
Hammatt, et al., 2004	Assessment	Waipahu Street, Waipahu, Waikēle (TMK 9-4-009, 9-4-059:072, 9-4-059:073, 9-4-059:074)	Identified no surface properties; notes extensive land disturbance
Jourdane, 1995a	Burial Report	Waiawa Road, Waiawa (TMK 9-6-003:005)	50-80-09-5302 (one burial)
McGerty and Spear, 1995	Assessment	Mānana, Waiawa (TMK 9-7-023:001; 9-7-024:006)	None
Rasmussen and Tomonari-Tuggle, 2006	Monitoring	Waiau Fuel Pipeline route (TMK 9-1, 9-3, 9-4, 9-6, 9-7, and 9-8)	None
Rechtman and Henry, 1998	Reconnaissance Survey	Red Hill Fuel Storage Area, Waipi'o, Waiawa, Hālawā; Moanalua	None
Spear, 1993	Reconnaissance Survey	Waikēle Industrial Subdivision, Waikēle (TMK 9-4-002:004)	50-80-091345 (Wakamiya Inari Shrine)
Yent and Ota, 1991	Reconnaissance	Proposed Rainbow Bay State Park (TMK 9-8-, 9-9-)	None

Hālawā Stream to Pacific Street

This alignment extends from Hālawā Stream along Kamehameha Highway to Nimitz Highway. It covers much of the same area as the Nimitz Highway/Halakauwila Street/Kapi‘olani Boulevard alignment of Section 5 of Alternative 4. The impact on potential resources would be a medium rating for archaeological resources, historic resources, and burials.

Table 5-3. Hālawā Stream to Pacific Street

Author	Nature of Study	Location (TMK 1-)_	Sites
Athens, 2000	Archaeological Study Hawaiian Fishponds	U.S. Navy Lands Pearl Harbor	50-80-13-0102 (Loko Kunana and Loko Muliwai)
Avery, et al., 1994	Monitoring	Hālawā Stream Mouth Hālawā (TMK 9-9-001; 9-9-003)	None
Borthwick, et al., 1995	Inventory Survey	Kapālāma (TMK 1-5-001:001)	None
Chiogioji and Hammatt, 1994	Assessment	Honolulu town (TMK 2-1-018:001, 2-1-018:011, 2-1-018:016, 2-1-018:046, 2-1-018:047)	None
Chiogioji and Hammatt, 1995	Assessment	Kapālāma-Sand Island (TMK 1-5-020; 1-5-034; 1-5-041; 1-5-042)	None
Cleghorn, 1989	Excavation	China Gateway (TMK 2-1-003:015, 2-1-003:023, 2-1-003:024, 2-1-003:025)	None
Davis, 1991	Monitoring	Ft. DeRussy (TMK 2-6-005:001)	No new sites
Dega and Davis, 2005	Inventory Survey	Middle Street Intermodal Center (TMK 1-2-018:001, 1-2-018:002, 1-2-018:009)	50-80-14-6683 (one historic trash pit in fill above Waikulu Fishpond)
Denham, et al., 1992	Inventory Survey	Nu‘uanu (TMK 1-7-03:32)	None
Dunn, et al., 1993	Inventory Survey	Nu‘uanu Court Project, Land of Nu‘uanu (TMK 2-1-002:026)	50-80-14-2456 (pre- and post-contact cultural deposits)
Elmore and Kennedy, 2002	Monitoring	Ft. DeRussy (TMK 2-6-005:001)	None
Dye, 1999	Archaeological Resources Survey	Hālawā Bridge, Hālawā (TMK 9-9-001:001; 9-9-002:004; 9-9-003:026, 9-9-003:029, 9-9-003:056)	No sites found during survey; fill material present
Erkelens, et al., 1994	Burial	Nu‘uanu-Kekaulike Park (TMK 1-7-003:032)	50-80-14-4875 (four burials)
Folk, et al., 1993	Inventory Survey	711 Middle Street (TMK 1-2-016:007)	50-80-14-4525 (three burials, two in coffins, and a subsurface cultural layer)
Goodwin and Allen, 2005	Data Recovery	Nu‘uanu-Kekaulike Park (TMK 1-7-003:032)	50-80-14-4875 (one burial)

Author	Nature of Study	Location (TMK 1-)_	Sites
Goodwin, et al., 1992, 1996	Data Recovery	Marin Tower Property, Nu'uano (TMK 1-7-002:003, 1-7-002:004, 1-7-002:005, 1-7-002:042)	50-80-14-4494 (pre-contact and post-contact cultural deposits with 15 burials)
Heidel and Hammatt, 1994	Data Recovery	Nu'uano-Chinatown (TMK 1-7-003:014)	50-80-14-1346 (O'ahu Fire Stations)
Hurst, 1991	Preliminary Data Recovery	Nu'uano, Harbor Court (TMK 2-1-002:016, 2-1-002:020, 2-1-002:056)	historic deposits
Hurst and Allen [Pantaleo], 1992	Monitoring and Inventory Survey	Nu'uano, Harbor Court (TMK 2-1-002:016, 2-1-002:020, 2-1-002:056)	50-80-14-2426 (mainly historic artifact cache)
Kennedy, 1984	Investigations	Nu'uano (TMK 2-1-002:038, 2-1-002:039)	None
Kennedy, et al., 1994	Inventory Survey	Nu'uano-Kekaulike Park (TMK 1-7-003:032)	50-80-14-4587 (Pehu fishpond); 50-80-14-4588 (three burials)
Landrum and Dixon, 1992	Mitigation	River-Nimitz Project, Nu'uano (TMK 1-7-002:027)	50-80-14-4192 (historic trash pits; one burial)
Lebo and McGuirt, 2000b	Data Recovery	800 Nu'uano (TMK 1-7-002:002)	50-80-14-5496 (19th-20th century cultural deposits)
Lebo and Rosendahl, 2002	Data Recovery	Nu'uano, Harbor Court (TMK 2-1-002:016, 2-1-002:020, 2-1-002:056)	50-80-14-2456 (pre/post-contact cultural deposit with five burials)
McDermott and Mann, 2001	Inventory Survey	Nimitz Hwy Water System (TMK 1-5-008; 1-7-001; 2-1-002)	50-80-14-5966 (Kawa fishpond)
McGerty, et al., 1995	Assessment	Nu'uano-Chinatown (TMK 1-7-003:014, 1-7-003:015)	None
McGerty, et al., 1997	Data Recovery	Kalihi, Pālāma (TMK 1-5-007:001, 1-5-007:014, 1-5-007:015, 1-5-007:018, 1-5-007:057, 1-5-007:058, 1-5-007:060 to :078)	50-80-14-5368 (Kūwili fishpond)
McIntosh and Cleghorn, 2005	Inventory Survey	Pearl Street One Building, Honolulu	50-80-14-6680 (<i>lo'i</i> -irrigated taro patch)
Nakamura, et al., 1994	Assessment	Kapālāma (TMK 1-6-003:042, 1-6-003:043, 1-6-003:044, 1-6-003:045, 1-6-003:046, 1-6-003:051, 1-6-003:052, 1-6-003:053, 1-6-003:079, 1-6-003:080, 1-6-003:081, 1-6-003:087, 1-6-003:089)	None
O'Hare, et al. 2003a	Data Recovery Plan	Nimitz Highway (TMK 1-5-008, 1-7-001, 2-1-002)	50-80-14-5966 (Kawa fishpond); due to gasoline contamination of the soil, no samples from the fishpond could be collected
Riley, et al., 1995	Data Recovery	Nu'uano-Kekaulike Park (TMK 1-7-003:032)	50-80-14-4587 (Pehu fishpond); 50-80-14-4588 (three burials)

Author	Nature of Study	Location (TMK 1-)_	Sites
Simons, et al., 1995	Data Recovery	Ft. DeRussy (TMK 2-6-005:001)	No new sites
Wickler, et al., 1991	Settlement Plan Study	Shafter Flats (TMK 1-1-035:001)	None
Williams and Anderson, 1997	Monitoring	Shafter Flats (TMK 1-1-035:002)	None

Alternative 4: Fixed Guideway

Section I – Kapolei to Fort Weaver Road

Section I extends through the ‘Ewa Plain, between the foothills of the Ko‘olau Mountains and the coast, entirely within the *ahupua‘a* of Hono‘uli‘uli. The arid sections of the ‘Ewa Plain have few pre-contact archaeological remains, usually consisting of features associated with trails or temporary habitation. The four alignments for Section I are adjacent to the recently developed government, commercial, and residential center of Kapolei, and to older villages, such as Hono‘uli‘uli and ‘Ewa Villages. The ‘Ewa Plain consists of a flat karstic raised limestone reef forming a level, nearly featureless “desert” plain marked in pre-contact times (previous to alluviation caused by sugar cultivation) by a thin or non-existent soil mantle. The microtopography is notable in containing countless sinkholes in some areas caused by chemical weathering (dissolution) of the limestone shelf. These sinkholes were once used as nesting sites for birds (some now extinct), and for water collection, agriculture, habitation, and burials by Hawaiians. Although the greater portion of the ‘Ewa Plain seems “featureless,” these sinks, sometimes found in clusters, but often found isolated from other archaeological features, have the potential to contain palentological information, pre-contact deposits, and surface features and burials.

The Geiger Road/Fort Weaver Road alignment of this section is the most *makai* of the alignments and has the greatest potential to impact archaeological resources. The northern portion of Fort Weaver Road bisects an area labeled on maps as the Hono‘uli‘uli Taro Lands, which once extended east from Hō‘ae‘ae Point on the West Loch of Pearl Harbor to Old Fort Weaver Road on the west. This area was used from the pre-contact period through the historic period for permanent habitation, the cultivation of taro and other crops, and the collection of the rich marine resources of West Loch. This portion of the alignment has the highest potential for impact to archaeological remains. The potential for impact to human burials is rated as low as only two possible pre-contact burials have been found in this area. Although the potential for pre-contact cultural deposits in this section of the alignment is high, the potential for pre-contact sites along the entire alignment is rated medium since the road section adjacent to this traditional habitation area comprises less than 50% of the entire length of the alignment.

The potential for all three types of archaeological resources decreases for alignments in direct correlation with their distance from the coast and from the West Loch of Pearl Harbor. Thus, the most mauka alignment, Kamokila Boulevard/Farrington Highway, has the least potential to impact archaeological resources. All three mauka alignments,

Kamokila Boulevard/Farrington Highway, Kapolei Parkway/North South Road, and Saratoga Avenue-North South Road, have a low impact potential for burials, pre-contact cultural deposits, and historic features.

Kamokila Boulevard/Farrington Highway

The Kamokila Boulevard/Farrington Highway alignment's potential to encounter archaeological resources is low for burials, pre-contact archaeology, and historic archaeology (Table 5-4). Nearly the entire length of this alignment has been surveyed for surface features one or more times. Soils are thin in this area, resulting in the low potential for subsurface cultural deposits or burials. Only a few scattered sugar cane plantation infrastructure features, such as irrigation ditches, flumes, and pumps, have been recorded during previous archaeological surveys.

This alignment does pass within viewing distance of Pu'u Kapolei, a topographic feature that plays an important part in Hawaiian mythology and cosmology, early post-contact history, and World War II history. In Hawaiian mythology, Pu'u Kapolei was the home of the family of Kamapu'a, the Hawaiian pig-god. The plains surrounding Pu'u Kapolei were known as a place for the wandering of lost souls, and a *heiau* on the summit was used to mark the changing of the seasons. In post-contact times, Pu'u Kapolei was the primary marker on the inland trail extending from Pearl Harbor to Wai'anae. This former trail is now covered with the present-day Farrington Highway alignment. Before and during World War II, gun emplacements for Battery Hatch and Fort Barrette were built on the summit of Pu'u Kapolei to defend Pearl Harbor. Although construction of the Kamokila/Farrington Highway alignment would not physically impact this hill, any major changes in the surrounding landscape might impact the visual integrity of this important site.

Table 5-4. Kamokila Boulevard/Farrington Highway

Author	Nature of Study	Location (TMK 1-)	Sites
Burgett and Rosendahl, 1989	Subsurface Testing	Ko 'Olina (TMK 9-1-015:008)	None
Clark, 1977	Reconnaissance Survey	Pu'u Kapolei, Hono'uli'uli (TMK 9-1-016:002)	WWII construction has destroyed all pre-contact surface features. Many military structures remain
Hammatt and Chiogioji, 1997	Reconnaissance Survey	North-South Road Corridor, Hono'uli'uli	No new sites
Hammatt and Shideler, 1990	Reconnaissance	West Loch Bluffs, Hono'uli'uli (TMK 9-1-017:004)	50-80-12-4344 (plantation infrastructure), -4345 (railroad berm), -4346, 4347. and -4348 (three pumping stations)
Hammatt and Shideler, 1999	Assessment	St. Francis Medical Center, Hono'uli'uli (TMK 9-1-017, 9-1-060)	No surface features found; previously identified site 50-80-12-3321 (subsurface pre-contact cultural deposit) may extend into this area

Author	Nature of Study	Location (TMK 1-)	Sites
Hammatt and Shideler, 2001	Inventory Survey	Southern Cross Cable Station, Hono'uli'uli (TMK 9-1-014, 9-1-015)	50-80-12-4341 (OR&L Railroad); 50-80-12-4341 (historic irrigation infrastructure)
Hammatt, et al., 1990	Reconnaissance	'Ewa Villages, Hono'uli'uli	No archaeological features, but some historic plantation-era structures remain
Haun, 1986a and b	Reconnaissance Survey	'Ewa Town Center, Hono'uli'uli (TMK 9-1-015:005, 9-1-015:017, 9-1-016:006, 9-1-016:030)	One irrigation ditch, site 50-80-12-4341, recorded
Hoffman, et al., 2005	Inventory Survey	West Kapolei, Hono'uli'uli (TMK 9-1-014:033, 9-1-015:020)	Nineteen sites recorded. Only two plantation-era sites near the alignment, Sites 50-80-12-6689, a concrete irrigation flume, and 50-80-12-6679, a water control ditch
Kennedy, 1991a	Subsurface Testing	Pu'u Kapolei, Hono'uli'uli (TMK 9-1-016:002)	Site 50-80-12-138 (all military structures associated with Fort Barrette)
O'Hare, et al., 2004b	Reconnaissance Survey	West Kapolei area, Hono'uli'uli (TMK 9-1-015:004)	Site 50-80-12-6678 (five plantation irrigation features); Site 50-80-12-6679 (historic drainage ditch)
O'Hare, et al., 2005b	Literature Review and Field Check	Kapolei Interchange, Hono'uli'uli	Found previously recorded Site 50-80-12-6678 (historic irrigation ditch)
O'Hare, et al., 2006b	Assessment	Kamokila Boulevard Extension, Hono'uli'uli (TMK 9-1-016:001, 9-1-016:012, 9-1-016:032)	Construction of extension will impact Site 50-80-12-9714 (OR&L Railroad right-of-way)
Ostroff, et al., 2001b	Inventory Survey with Subsurface Testing	Pu'u Kapolei, Hono'uli'uli (TMK 9-1-016:002)	Site 50-80-12-0138 (<i>heiau</i> ; now destroyed); Site 50-80-12-5918 pre-contact remains (mound and petroglyph); Site 50-80-12-138 (all military structures associated with Fort Barrette)
Rasmussen and Tomonari-Tuggle, 2006	Monitoring	Waiau Fuel Pipeline route (TMK 9-1, 9-3, 9-4, 9-6, 9-7, and 9-8)	None

Kapolei Parkway/North-South Road

The Kapolei Parkway/North-South Road alignment extends Koko Head through the inland 'Ewa Plain, then turns north toward Farrington Highway (Table 5-5). The potential for burials, pre-contact archaeology, and historic archaeology is low. As with the Kamokila Boulevard/Farrington Highway alignment, this portion of the 'Ewa Plain is generally devoid of substantial pre-contact habitation or agricultural deposits due to the thin soil; however, this alignment parallels the lower portion of Kalo'i Gulch for some distance, and it is possible that some traditional Hawaiian agricultural features are still

extant along this waterway. In previous archaeological surveys, only scattered plantation-era features, such as ditches, flumes, reservoirs, and pumps, have been recorded.

Table 5-5. Kapolei Parkway/North-South Road

Author	Nature of Study	Location (TMK 1-)	Sites
Burgett and Rosendahl, 1990	Subsurface Testing	Ko 'Olina (TMK 9-1-015:008)	None
Hammatt and Chiogioji, 1997	Reconnaissance Survey	Hono'uli'uli (TMK 9-4-011)	No new sites
Hammatt and Shideler, 1990	Reconnaissance Survey	West Loch Bluffs, Hono'uli'uli (TMK 9-1-017:004)	50-80-12-4344 (plantation infrastructure), -4345 (railroad berm), -4346, 4347, and -4348 (three pumping stations)
Hammatt and Shideler, 1999	Assessment	St. Francis Medical Center, Hono'uli'uli (TMK 9-1-017:017, 9-1-017:060)	No surface features found; previously identified site 50-80-12-3321 (subsurface pre-contact cultural deposit) may extend into this area
Hammatt and Shideler, 2001	Inventory Survey	Proposed Fiber Optic Cable Route, Hono'uli'uli (TMK 9-1-014, 9-1-015)	50-80-12-4341 (OR&L Railroad); 50-80-12-4341 (historic irrigation infrastructure)
Hammatt, et al., 1990	Reconnaissance	'Ewa Villages, Hono'uli'uli	No archaeological features, but some historic plantation-era structures remain
Haun, 1986a and b	Reconnaissance Survey	'Ewa Town Center, Hono'uli'uli (TMK 9-1-015:005; 9-1-015:017; 9-1-016:006, 9-1-016:030)	One irrigation ditch, site 50-80-12-4341, recorded
Hoffman, et al., 2005	Inventory Survey	Hono'uli'uli (TMK 9-1-147:033, 9-1-015:020)	Nineteen sites recorded. Only two plantation-era sites near the alignment, Sites 50-80-12-6689, a concrete irrigation flume, and 50-80-12-6679, a water control ditch
Rasmussen and Tomonari-Tuggle, 2006	Monitoring	Waiau Fuel Pipeline route (TMK 9-1, 9-3, 9-4, 9-6, 9-7, and 9-8)	None

Saratoga Avenue/North-South Road

The western portion of the Saratoga Avenue/North-South Road alignment follows the Geiger Road/Fort Weaver Road alignment, and the eastern portion follows the Saratoga Avenue/North-South Road alignment (Table 5-6). The potential for burials, pre-contact archaeology, and historic archaeology for the entire alignment is low. In the western section, the alignment extends into the northern portion of the former Barbers Point Naval Air Station. Surface rock habitation features, modified karstic sinks, and subsurface cultural deposits have been recorded throughout this area, primarily concentrated at the coast, but with scattered features near the northern border. The sinks sometimes contain deposits of fossil bird bones, pre-contact cultural material and

features, and human burials. The northern portion of Barbers Point has been extensively surveyed. All sinks near the alignment have been recorded and tested. Some contained cultural material, but none contained burials. In the eastern section along the proposed North-South Road, only scattered plantation-era features (e.g., ditches, flumes) have been recorded.

Table 5-6. Saratoga Avenue/North-South Road

Author	Nature of Study	Location	Sites
Burgett and Rosendahl, 1990	Subsurface Testing	Ko'olina (TMK 9-1-015:008)	None
Hammatt and Chiogioji, 1997	Reconnaissance Survey	Hono'uli'uli (TMK 9-4-011)	No new sites
Hammatt and Shideler, 1990	Reconnaissance Survey	West Loch Bluffs, Hono'uli'uli (TMK 9-1-017:004)	50-80-12-4344 (plantation infrastructure), -4345 (railroad berm), -4346, 4347. and -4348 (three pumping stations)
Hammatt and Shideler, 1999	Assessment	Hono'uli'uli (TMK 9-1-017, 9-1-060)	50-80-12-3321 (habitation)
Hammatt and Shideler, 2001	Inventory Survey	Proposed Fiber Optic Cable Route, Hono'uli'uli (9-1-014, 9-1-005)	50-80-12-4341 (OR&L Railroad); 50-80-12-4341 (historic irrigation infrastructure)
Hammatt, et al., 1990	Reconnaissance	'Ewa Villages, Hono'uli'uli	No archaeological features, but some historic plantation-era structures remain
Haun, 1986a and b	Reconnaissance Survey	'Ewa Town Center, Hono'uli'uli (TMK 9-1-015:005, 9-1-015:017, 9-1-016:006, 9-1-016:030)	None
Haun, 1991	Reconnaissance Survey	Barbers Point (northern section)	50-80-13-1717 to 1724, 1726, 1727, 1729 (pre-contact habitation/agricultural complexes)
Hoffman, Freeman, et al., 2005	Inventory Survey	Hono'uli'uli (TMK 9-1-14:033, 9-1-015:020)	Nineteen sites recorded. Only two historic sites near the alignment, 50-80-12-6689, a concrete irrigation flume, and -6679, a water control ditch
Landrum and Schilz, 1993	Reconnaissance Survey	Barbers Point (northern section)	50-80-13-1729 (modified karstic sink)
O'Hare, et al., 2004b	Reconnaissance Survey	West Kapolei (9-1-015:004)	Site 50-80-12-6678 (five plantation irrigation features); Site 50-80-12-6679 (historic drainage ditch)
Rasmussen and Tomonari-Tuggle, 2006	Monitoring	Waiau Fuel Pipeline route (TMK 9-1, 9-3, 9-4, 9-6, 9-7, and 9-8)	None
Tuggle, 1997	Inventory Survey	Barbers Point (northern section)	50-80-13-4702 (modified karstic sink)
Welch, 1987	Reconnaissance Survey	Barbers Point (northern section)	50-80-13-4702, -3721 (pre-contact habitation complex around modified sinks)

Geiger Road/Fort Weaver Road

The Geiger Road/Fort Weaver Road alignment's potential to encounter historic resources is low (Table 5-7). The southeastern section, along Fort Weaver Road, is adjacent to, but does not pass through, the historic 'Ewa Villages, associated with sugar cane plantation camps of the 18th and 19th centuries. During archaeological studies in this area, plantation infrastructure features, older than 50 years, have been recorded; however, it is unlikely that any features remain directly adjacent to Fort Weaver Road. The potential for pre-contact cultural deposits is rated as medium, as discussed at the beginning of this section. The northern section of Fort Weaver Road passes through the former habitation/agricultural Hono'uli'uli Taro Lands. The potential for burials is low; only three have been recorded in the Hono'uli'uli Taro Lands at the northeastern end of the alignment. The middle section of this alignment extends into the former area used for the Barbers Point Naval Air Station, where burials have been found within karstic sinks. Only three sites, comprised of modified karstic sinks without burials, have been recorded in Barbers Point near the proposed alignment; therefore, the potential for burials in this section is also rated as low.

Table 5-7. Geiger Road/Fort Weaver Road

Author	Nature of Study	Location (TMK 1-)	Sites
Bath, 1989	Burial	Hō'ae'ae Point, West Loch Estates, Hono'uli'uli (TMK 9-1-017:023)	50-80-13-04816 (one burial)
Burgett and Rosendahl, 1989	Subsurface Testing	Ko'olina Resort, Hono'uli'uli (TMK 9-1-015:008)	None
Collins and Jourdane, 2004	Burial Report	Fort Weaver Road, Hono'uli'uli Taro Lands (TMK 9-1-019:001)	50-80-04-6665 (one burial)
Davis, 1988	Subsurface Testing	'Ewa Gentry, Hono'uli'uli (TMK 9-1-010:002, 9-1-010:007, 9-1-012:001, 9-1-012:029)	No cultural remains
Dicks, et al., 1987	Reconnaissance	West Loch Estates, Hono'uli'uli (TMK 9-1-017:001, 9-1-017:006, 9-1-017:013, 9-1-017:014, 9-1-017:015, 9-1-017:018, 9-1-017:025, 9-1-017:041)	50-80-08-3321 (cultural deposit with one burial); 50-80-12-3319 (modern cemetery), -3322 (buried fishpond), -3323 (historic fishpond), -3324 (buried pond system), 50-80-13-3318 (historic site), -3320 (historic site)
Goodfellow, Dunn, et al., 1998	Data Recovery	West Loch Estates, Hono'uli'uli (TMK 9-1-017:001, 9-1-017:006, 9-1-017:013, 9-1-017:014, 9-1-017:015, 9-1-017:018, 9-1-017:025, 9-1-017:041)	50-80-08-3321 (cultural deposit with one burial); 50-80-12-3319 (modern cemetery), -3322 (buried fishpond), -3323 (historic fishpond), -3324 (buried pond system); 50-80-13-3318 (historic site), -3320 (historic site)

Author	Nature of Study	Location (TMK 1-)	Sites
Hammatt and Shideler, 1990	Reconnaissance	West Loch Bluffs, Hono'uli'uli (TMK 9-1-017:004)	50-80-12-4344 (plantation infrastructure), -4345 (railroad berm), -4346, 4347. and -4348 (three pumping stations)
Hammatt and Shideler, 1999	Assessment	St. Francis Medical Center, Hono'uli'uli (TMK 9-1-17:017, 9-1-17:060)	No surface features found; previously identified site 50-80-12-3321 (subsurface pre-contact cultural deposit) may extend into this area
Hammatt and Shideler, 2001	Inventory Survey	Proposed Fiber Optic Cable Route, Hono'uli'uli (TMK 9-1-014, 9-1-015)	50-80-12-4341 (OR&L Railroad); 50-80-12-4341 (historic irrigation infrastructure)
Haun, 1986a and b	Reconnaissance Survey	'Ewa Town Center, Hono'uli'uli (TMK 9-1-015:005, 9-1-015:017, 9-1-016:006, 9-1-016:030)	None
Haun, 1991	Reconnaissance Survey	Barbers Point (northern section)	50-80-13-1717 to 1724, 1726, 1727, 1729 (pre-contact habitation/agricultural complexes)
Hoffman, et al., 2005	Inventory Survey	Kapolei West, Hono'uli'uli (TMK 9-1-047:033, 9-1-015:020)	Nineteen sites recorded. Only two plantation-era sites near the alignment, Sites 50-80-12-6689, a concrete irrigation flume, and 50-80-12-6679, a water control ditch
Kennedy, 1988	Reconnaissance Survey	'Ewa Gentry, Hono'uli'uli (TMK 9-1-010:002, 9-1-010:007, 9-1-012:001, 9-1-012:029)	50-80-12-9714 (OR&L Railroad bed/right-of-way)
Landrum and Schilz, 1993	Reconnaissance Survey	Barbers Point (northern section)	50-80-13-1729 (modified karstic sink)
O'Hare, et al., 2004b	Reconnaissance Survey	West Kapolei area (TMK 9-1-015:004)	Site 50-80-12-6678 (five plantation irrigation features), Site 50-80-12-6679 (historic drainage ditch)
O'Hare, et al., 2006a	Inventory Survey	Ho'opili project-East Kapolei (formerly West Loch Bluffs (TMK: 9-1-010:002, 9-1-017:004, 9-1-017:059, 9-1-017:072, 9-1-018:001, 9-1-018:004, 9-2-001:001)	No sites found in portion of the project area adjacent to Ford Weaver Road and West Loch
Rasmussen and Tomonari-Tuggle, 2006	Monitoring	Waiau Fuel Pipeline route (TMK 9-1, 9-3, 9-4, 9-6, 9-7, and -8)	None
Tuggle, 1997	Inventory Survey	Barbers Point (northern section)	50-80-13-4702 (modified karstic sink)
Welch, 1987	Reconnaissance Survey	Barbers Point (northern section)	50-80-13-4702, -3721 (pre-contact habitation complex around modified sinks)

Section I – Sundry Sites

Nine sundry sites are located within Section I. No sundry sites have a high potential to impact any type of historic archaeological resource. One site has a high potential to impact pre-contact archaeological features and burials, and the remaining eight sundry sites have a low potential to impact any type of archaeological resource.

The sundry site with a high potential to impact pre-contact archaeological features and burials is located where two alignments (Geiger Road/Fort Weaver Road and Saratoga Avenue/North-South Road) approach Saratoga Road in the northern section of the former Barbers Point Naval Air Station and extend north toward the H-1 highway. This area is recorded as having a pre-contact Hawaiian habitation/agricultural/ burial complex. The complex is comprised of 11 identified sites with at least 44 component features, such as rock enclosures, platforms, mounds, and modified karstic sinks.

Section II – Fort Weaver Road to Aloha Stadium

The Farrington Highway/Kamehameha Highway alignment has had little archaeological study (Table 5-8). This area is notable for its proximity to the upper portion of the west, middle and east lochs of Pearl Harbor. In the pre-contact and early post-contact period, the margins of the lochs were modified for fishponds. The majority of these were filled during the later historic period, but fishpond and wetland sediments probably exist intact below these fill layers. Archaeological projects involving the collection of soil cores from fishponds have produced new and interesting information on the environment of O‘ahu before the first Hawaiian settlement regarding climate change (some of which was probably human-induced) and regarding the time and construction of large fishponds. Only a few burials have been reported near this alignment, usually close to the shores of Pearl Harbor. Other features reported from this area are pre-contact cultural deposits, historic deposits, and plantation infrastructure, especially workers camps.

Many projects emphasize the extent of agricultural and urban disturbance in this area, with several reporting the presence of thick fill layers near Pearl Harbor. Since only a few burials have been reported, the impact for this resource is rated as low. The alignment may affect paleoenvironmental sites, archaeological subsurface deposits, and historical surface features; therefore, the impacts to pre-contact and historic archaeological resources are rated as medium.

Table 5-8. Farrington Highway/Kamehameha Highway

Author	Nature of Study	Location	Sites
Athens, 2000	Pearl Harbor Fishpond Study	U.S. Navy Lands Pearl Harbor	Ponds researched in report are not near the alignment
Chafee and Anderson, 1995	Burial Report	Waiawa Road, Waiawa Ahupua‘a (TMK 9-6-003:005)	50-80-09-5302 (one burial)
Cleghorn, 1996c	Reconnaissance Survey	O‘ahu Sugar Co. Mill, Waipahu, Waikele Ahupua‘a (TMK 9-4-002:004)	Plantation mill structures were noted, but not recorded; no traditional Hawaiian sites

Author	Nature of Study	Location	Sites
Dega and O'Rourke, 2003	Evaluation Report	Pearl City (TMK 9-8-007:001, 9-9-006:020)	No sites in project area, but authors do report on site 50-80-12-6383, a burial in Blaisdell Park
Folk, 1990	Reconnaissance Survey	Waipahu Street, Waikele (TMK 1-9-4-)	No sites recorded, but notes rich cultural history in area
Fong, et al., 2005	Literature Review and Field Inspection	13-acre Mānana Parcel B, Waiawa and Mānana (TMK 9-7-024:057)	None
Goodman and Nees, 1991	Reconnaissance - Inventory Survey	Waiawa Ahupua'a (TMK 9-4-006:011, 9-4-026, 9-6-004:001, 9-6-004:004, 9-6-004:016, 9-6-005:001 to :014)	No reported sites near Section II alignment
Hammatt and Borthwick, 1985	Reconnaissance Survey	37-acre wetland parcel, Waiawa (TMK 9-6-003:025, 9-6-003:026, 9-6-003:027, 9-6-003:028)	No site number for wetland designated; notes rich cultural history of area
Hammatt and Chiogioji, 2000a	Assessment	2,600-foot portion of Farrington Highway, Waikele (TMK 9-4-011)	No archaeological sites found; discussion of bridges
Hammatt, et al., 2000	Inventory Survey	Manager's Drive, Waikele (TMK 9-4-002:005)	50-80-09-0530 (petroglyphs at northwest lot corner); 50-80-09-4660 (Higashi Plantation Camp in southwest corner)
Hammatt, et al., 2004	Assessment	Waipahu Street, Waipahu, Waikele (TMK 9-4-009, 9-4-059:072, 9-4-059:073, 9-4-059:074)	Identified no surface properties; notes extensive land disturbance
Jourdane, 1995a	Burial Report	Waiawa Road, Waiawa (TMK 9-6-003:005)	50-80-09-5302 (one burial)
McGerty and Spear, 1995	Assessment	Mānana and Pearl City Junction, Mānana, Waiawa (TMK 9-7-023:001, 9-7-024:006)	None
Perzinski, et al., 2004	Inventory Survey	Queen Emma Foundation, Waipi'o (TMK 9-4-038:083, 9-4-050:059)	50-80-09-6671 (surface remains of the 'i-Brown family home); 50-80-09-6672 (cultural deposit); 50-80-09-6673 (with two burials)
Perzinski, et al., 2006	Data Recovery	Queen Emma Foundation, Waipi'o (TMK 9-4-038:083, 9-4-050:059)	Additional work at Sites 50-80-09-6672 and -6673 (disinterment of burials)
Rechtman and Henry, 1998	Reconnaissance Survey	Red Hill Fuel Storage Area, Waipi'o, Waiawa, Hālawā, Moanalua	None
Spear, 1993	Reconnaissance Survey	Waikele Industrial Subdivision, Waikele (TMK 9-4-002:004)	50-80-091345 (Wakamiya Inari Shrine)
Spear, 1994	Reconnaissance Survey	Waikele Industrial Subdivision, Waikele (TMK 9-4-002:004)	O'ahu Sugar Co. plantation worker's camp (no SIHP number)

Section III – Aloha Stadium to Middle Street

Few archaeological studies have been conducted near the Section III alignment and these are clustered at the northern end adjacent to Pearl Harbor (Tables 5-9 through 5-12). The extensive Bishop Museum documentation associated with the H-3 project did not extend to the mouth of Hālawā Stream, and thus their research is not pertinent to this project. At one point, Section III is adjacent to Hickam Air Force Base where numerous archaeological projects have been conducted. All of these reports were searched, but they generally focused on coastal fishponds, which are not near the alignments. None of the recorded sites at Hickam Air Base is located near the alignments. The studies pertinent to the four alignments of Section III are almost all the same.

No burials have been reported near Section III, and thus the impact to this resource is rated as low for all four alignments. Reported sites along Section III include fishponds, usually buried beneath a fill layer. This fill layer may contain early historic artifacts. The potential to impact pre-contact and historic archaeological resources along the Mauka of the Airport Viaduct, Makai of the Airport Viaduct, and the Aolele Street alignments is rated as medium. The ratings for the Salt Lake Boulevard alignment for these two resources are low, primarily because of the massive land modification in this area.

Table 5-9. Salt Lake Boulevard

Author	Nature of Study	Location (TMK 1-)	Sites
Barrera, 1971	Inventory Survey	Aloha Stadium, Hālawā (TMK 9-9-003:061)	No sites; notes massive land modification
Hammatt, 1995a	Reconnaissance Survey	20-acre lot for proposed Hālawā Well	No sites; project area had been fully graded
Wickler, et al., 1991	Settlement Plan Study	Shafter Flats (TMK 1-1-035:001)	None
Williams and Anderson, 1997	Monitoring	Shafter Flats (TMK 1-1-035:002)	None

Table 5-10. Mauka of the Airport Viaduct

Author	Nature of Study	Location (TMK 1-)	Sites
Athens, 2000	Archaeological Study Hawaiian Fishponds	U.S. Navy Lands Pearl Harbor	50-80-13-0102 (Loko Kunana and Loko Muliwai)
Avery, et al., 1994	Monitoring	Hālawā Stream Mouth Hālawā (TMK 9-9-001; 9-9-003)	None
Barrera, 1971	Inventory Survey	Aloha Stadium, Hālawā (TMK 9-9-003:061)	No sites; notes massive land modification
Dye, 1999	Archaeological Resources Survey	Hālawā Bridge, Hālawā (TMK 9-9-001:001; 9-9-002:004; 9-9-003:026, 9-9-003:029, 9-9-003:056)	No sites found during survey; fill material present
Williams, 1993	Monitoring and Testing	Hālawā (TMK 9-9-001:016)	50-80-13-0102 (Loko Kunana and Loko Muliwai)

Author	Nature of Study	Location (TMK 1-)	Sites
Williams, 1994	Inventory Survey	Hālawā (TMK 9-9-001:016)	50-80-13-0102 (Loko Kunana and Loko Muliwai)
Yent and Ota, 1981	Reconnaissance Survey	Rainbow Bay State Park, 'Aiea (TMK 9-8-; 9-9-)	No new sites; area formerly had two fishponds (Kahakupohaku Pond and Loko Pa'aiau)

Table 5-11. Makai of the Airport Viaduct

Author	Nature of Study	Location	Sites
Athens, 2000	Archaeological Study Hawaiian Fishponds	U.S. Navy Lands Pearl Harbor	50-80-13-0102 (Loko Kunana and Loko Muliwai)
Avery, et al., 1994	Monitoring	Hālawā Stream Mouth Hālawā (TMK 9-9-001; 9-9-003)	None
Barrera, 1971	Inventory Survey	Aloha Stadium, Hālawā (TMK 9-9-003:061)	No sites, notes massive land modification
Williams, 1993	Monitoring and Testing	Hālawā (TMK 9-9-001:016)	50-80-13-0102 (Loko Kunana and Loko Muliwai)
Williams, 1994	Inventory Survey	Hālawā (TMK 9-9-001:016)	50-80-13-0102 (Loko Kunana and Loko Muliwai)
Yent and Ota, 1981	Reconnaissance Survey	Rainbow Bay State Park, 'Aiea (TMK 9-8-; 9-9-)	No new sites; area formerly had two fishponds (Kahakupohaku Pond and Loko Pa'aiau)

Table 5-12. Aolele Street

Author	Nature of Study	Location (TMK 1-)	Sites
Athens, 2000	Archaeological Study of Ancient Hawaiian Fishponds	U.S. Navy Lands Pearl Harbor	50-80-13-0102 (Loko Kunana and Loko Muliwai)
Avery, et al., 1994	Monitoring	Hālawā Stream Mouth Hālawā (TMK 9-9-001; 9-9-003)	None
Barrera, 1971	Inventory Survey	Aloha Stadium, Hālawā (TMK 9-9-003:061)	No sites; notes massive land modification
Williams, 1993	Monitoring and Testing	Hālawā (TMK 9-9-001:016)	50-80-13-0102 (Loko Kunana and Loko Muliwai)
Williams, 1994	Inventory Survey	Hālawā (TMK 9-9-001:016)	50-80-13-0102 (Loko Kunana and Loko Muliwai)
Yent and Ota, 1981	Reconnaissance Survey	Rainbow Bay State Park, 'Aiea (TMK 9-8-; 9-9-)	No new sites; area formerly had two fishponds (Kahakupohaku Pond and Loko Pa'aiau)

Section IV – Middle Street to Iwilei

The dominating natural features of the short Section IV between Middle Street and Iwilei are the Kapālama and Kalihi Stream drainages. In the pre-contact period, Native Hawaiians intensively used the alluvial soils along these perennial streams for pondfield

agriculture. Dispersed habitation was associated with these agricultural lands. At the drainage mouths, fishponds were constructed and used for aquaculture. Land records from the mid-19th century indicate that this area was a settled and productive dispersed community outside the bounds of growing Honolulu. Numerous Land Commission Awards (LCA) were granted in this area, particularly along the drainages. In the later 19th century and first half of the 20th century, burgeoning Honolulu lead the development of this area. Coastal fishponds were filled for development, and former agricultural lands were developed for residential and commercial uses.

Previous archeological work within Section IV is sparse. Based on what has been done and the information from proxy data sets, however, it is likely that archaeological deposits are preserved beneath the area's modern surface. These archaeological deposits may be more concentrated near the alignment's intersections with Kapālama and Kalihi Streams. Because of the general lack of previous archaeological work, Section IV is more difficult to rate for potential archaeological impacts.

North King Street

The North King Street alignment's potential to encounter archaeological deposits is rated medium for all three categories of archaeological impacts. In the central portion of the alignment, a coffin burial was documented in association with Kaumakapili Church. At each end of the alignment, multiple burials were documented immediately adjacent to North King Street (Table 5-13).

Table 5-13. North King Street

Author	Nature of Study	Location (TMK 1-)	Sites
Borthwick, et al., 1995	Inventory Survey	Kapālama (TMK 1-5-001:001)	None
Dega and Davis, 2005	Inventory Survey	Middle Street Intermodal Center (TMK 1-2-018:001, 1-2-018:002, 1-2-018:009)	50-80-14-6683 (one historic trash pit in fill above Waikulu Fishpond)
Dunn, et al., 1991	Inadvertent Burial Discovery	North King Street and Robello Lane Kapālama (TMK 1-5-008:017, 1-5-008:018, 1-5-008:023)	SIHP 50-80-14-3373 (two burials)
Folk, et al., 1993	Inventory Survey	711 Middle Street (TMK 1-2-016:007)	50-80-14-4525 (three burials, two in coffins, and a subsurface cultural layer)
Hammatt, 1995b	Inadvertent Burial Discovery	Austin Lane and N. King Street, fronting Kaumakapili Church (TMK 1-5-005)	50-80-14-4929 (historic coffin burial)
Nakamura, et al., 1994	Assessment	Kapālama (TMK 1-6-003:042, 1-6-003:043, 1-6-003:044, 1-6-003:045, 1-6-003:046, 1-6-003:051, 1-6-003:052, 1-6-003:053, 1-6-003:079, 1-6-003:080, 1-6-003:081, 1-6-003:087, 1-6-003:089)	None
Neller, 1980a	Reconnaissance Survey	Kapālama Fire Station, (TMK 1-5-005:014)	None

Dillingham Boulevard

The Dillingham Boulevard alignment's potential to encounter archaeological deposits is rated medium for all three categories of archaeological impacts. Background research indicates no previous archaeological investigations were carried out along this alignment; however, the findings of the limited investigations along the North King Street alignment and the information from proxy data sets indicate a reasonable potential for archaeological deposits.

Section IV – Sundry Sites

Three sundry sites are located in Section IV. The sundry site at the corner of Dillingham Boulevard and Middle Street is a former historic fishpond. It also abuts a previous archaeological study that documented three burials and a subsurface cultural layer (Table 5-13). This sundry site is rated high for all three categories of archaeological impacts. The remaining two sundry sites along the North King Street alignment are rated medium for all three categories of archaeological impacts.

Section V – Iwilei to UH Mānoa

Section V includes the urban core of Honolulu, the rapidly developing area of Kā kā'āko, and portions of the Honolulu Plain extending up to the entrance of Mānoa Valley at the University of Hawai'i campus. The Waikīkī Spur down Kūhiō Avenue is a component of Section V. Of the five sections discussed under the Fixed Guideway Alternative, Section V has the greatest potential to impact archaeological resources.

This area has been a population and agricultural center for hundreds of years. First, there was substantial settlement in Waikīkī and lower Nu'uanu during the pre-contact era. With the historic development of Honolulu Harbor in the early 19th century, waterfront Honolulu quickly became a Pacific business and trading center. During the late 19th and first half of the 20th century, Section V from Honolulu Harbor, to Waikīkī, to the UH Mānoa Campus was completely developed by expanding residential and commercial interests.

This intensive land use history has left a rich archaeological record that has been documented in numerous previous archaeological investigations. Most of this archaeological research has been conducted along coastal portions of Honolulu, through Downtown, Kā kā'āko and Waikīkī. The alignments that pass through these areas all have a high rating for their potential to impact archaeological resources. The single more mauka alignment, Beretania Street/South King Street, extends predominantly over the Honolulu Plain, away from the intensive coastal prehistoric and historic land use. Accordingly, this alignment has a medium rating for impacts to archaeological resources.

For the following discussion, the three tunnels that are proposed as components of three of Section V's alignments will be discussed separately. These "cut-and-cover" tunnel excavations have a much greater potential to affect archaeological resources than the surface alignments. For some of the alignments, tables detailing past archaeological sites associated with the tunnels were prepared. For other alignments, the tunnels are included in the general table for that alignment.

Beretania Street/South King Street

As a whole, the Beretania Street/South King Street alignment's potential to encounter archaeological deposits is rated as medium for all three categories of archaeological impacts. However, the 'Ewa end of the alignment along Beretania Street is a "hot spot" that has a much higher potential for encountering archaeological deposits than the majority of the alignment along South King Street.

This *mauka*-most alignment of Section V extends from Iwilei along Beretania Street as a tunnel that emerges between Punchbowl and Alapa'i Streets. This tunnel passes through pre-contact and early historic settlements, fishponds, and pondfields at the mouth of Nu'uaniu Stream, the former settlement of Kou. It continues along the mauka edge of Chinatown and the early (1800-1850) historic portions of Honolulu. Fairly abundant previous archaeological research through this area has documented burials and prehistoric and historic archaeological deposits (Table 5-14).

The tunnel continues through the Capitol District, where historic deposits have been documented along with burials. Were this tunnel segment of the Beretania Street/South King Street alignment to be rated for potential archaeological impacts by itself, it would rate high for all three categories of archaeological impacts. This tunnel section, however, only comprises 25 to 30 percent of the overall alignment's length. As the alignment leaves Downtown Honolulu and extends toward the UH Mānoa campus, its potential for impacting archaeological resources decreases.

At Alapa'i Street the alignment switches to South King Street, and extends out to University Avenue and mauka to the UH Mānoa Campus. Burials have been documented along South King Street associated with the Catholic Cemetery located immediately 'Ewa of Ward Avenue. Generally, this portion of the alignment along South King Street across the Honolulu Plain is sufficiently removed from the pre-contact and early historic intensive coastal land use so that extensive archaeological deposits are not expected. The South King Street route, however, was an early historic transportation corridor, so historic deposits are not unexpected. At the Koko Head end of the alignment, historic maps and land documents indicate there were fairly extensive agricultural fields and dispersed settlement. This more intensive land use extends into the Mānoa area, where pond fields, a burial, and an archaeological complex have been documented (Table 5-15).

Table 5-14. Beretania Street/South King Street Tunnel Only

Author	Nature of Study	Location (TMK 1-)	Sites
Carpenter and Yent, 1995	Monitoring	Washington Place, Kennels, Nu'uaniu (TMK 2-1-018:001)	50-80-14-9907 (Washington Place)
Chiogioji and Hammatt, 1992a	Assessment	Iwilei parcel (TMK 1-5-008:001, 1-5-008:009, 1-5-008:011)	None
Chiogioji and Hammatt, 1994	Assessment	Honolulu town (TMK 2-1-018:001, 2-1-018:011, 2-1-018:016, 2-1-018:046, 2-1-018:047)	None

Author	Nature of Study	Location (TMK 1-)	Sites
Denham and Kennedy, 1993	Monitoring	Nu'uau-Capitol District (TMK 2-1-025:002)	50-80-14-4605 (one burial); 50-80-14-4606 (nine historic trash pits)
Dockall, 2003	Inventory Survey	Nu'uau-Washington Place (TMK 2-1-018:001)	50-80-14-9907 (Washington Place)
Dye, 2002	Monitoring	Nu'uau-Capitol District (TMK 2-1-017:001, 2-1-017:002)	50-80-14-1307 (State Capitol/Grounds)
Hammatt and Chiogioji, 1998b	Assessment	Nu'uau-Capitol Place (TMK 2-1-009:018, 2-1-009:027)	50-80-14-5760 (historical cultural deposit)
Han, 1980	Burial Report	Royal Queen Emma site (TMK 2-1-018:042, 8-4-002)	50-80-14-2299 (two burials)
Hawai'i Bottle Museum, 1982a and b	Historic Artifact Analysis	Nu'uau-Century Square (TMK 2-1-010:046)	Glass bottles found
Majors and Carpenter, 2000	Monitoring	Washington Place, Nu'uau (TMK 2-1-018:001)	50-80-14-9907 (Washington Place)
Mann and Hammatt, 2002a	Monitoring	King Street Rehabilitation (TMK 1-1-7-, 1-2-1-)	50-80-14-6371 (one burial)
McGerty, et al., 1997	Data Recovery	Kalihi, Pālāma (TMK 1-5-007:001, 1-5-007:014, 1-5-007:015, 1-5-007:018, 1-5-007:057, 1-5-007:058, 1-5-007:060 to :078)	50-80-14-5368 (Kūwili fishpond)
Perzinski, et al., 2000a	Inventory Survey	Capital Place (TMK 2-1-09:18)	50-80-14-5760 (cluster of mid-19 th -century subsurface features)
Perzinski, et al., 2005	Data Recovery	Nu'uau-Capitol Place (TMK 2-1-009:018)	50-80-14-5760 (historical cultural deposit)
Simons, et al., 1991	Monitoring	Honolulu town (TMK 2-1-017:001)	None
West, et al., 2002	Monitoring	Nu'uau, Liliha (TMK 1-5-006, 1-5-007, 1-5-008, 1-7-026, 1-7-027)	Historic cultural deposit; newly identified deposit of 50-80-14-5942 (Honolulu Rapid Transit and Land Company Trolley)

Table 5-15. Beretania Street/South King Street, Excluding Tunnel

Author	Nature of Study	Location (TMK 1-)	Sites
Anderson, 1995	Inventory Survey	King Street Prop. (TMK 2-1-004:041, 2-1-004:042, 2-1-004:043)	50-80-14-5373
Esh and Hammatt, 2004a	Monitoring	Ala Moana (TMK 2-3-006, 2-3-007, 2-3-010, 2-3-011, 2-3-012, 2-3-014 to 2-3-015, 2-3-035, 2-3-038, 2-4-003 to 2-4-004, 2-4-010, 2-4-012)	None

Author	Nature of Study	Location (TMK 1-)	Sites
Esh and Hammatt, 2006	Monitoring	Pi'ikoi Street between Ala Moana Blvd. and Matlock Street	None
Wolforth and Haun, 1996	Inventory Survey	Mānoa, Pālolo-KP Trans (TMK 2-7-, 2-8-, 2-9-, 3-2-, 3-3, 3-4)	50-80-14-4266 (one burial); 50-80-14-4498 (pondfield); 50-80-14-5463 (complex); 50-80-14-1352; 50-80-14-9749

Hotel Street/Waimanu Street/Kapi'olani Boulevard

This alignment's potential to encounter archaeological resources is rated high for all three archaeological impact categories.

The 'Ewa end of this alignment passes through the same archaeologically significant areas as the 'Ewa end of the Beretania Street/South King Street alignment, including the pre-contact and early historic settlement, fishponds, and pond fields at Iwilei and the mouth of Nu'uanu Stream, the historic and prehistoric deposits documented within the Chinatown Historic District, and the burials and archaeological deposits of the Capitol District. In the vicinity of the Capitol Building the surface alignment switches to a tunnel that extends to Waimanu Street. This tunnel traverses an important archaeological and cultural area that includes deposits related to Kapi'olani Palace and other past residences of Hawaiian monarchs. Past archaeological work in the vicinity has documented burials and historic and prehistoric archaeological resources (Table 5-16).

Along Waimanu Street, the alignment returns to the surface, extending through the area known today as Kākā'āko. Waimanu Street through present day Kākā'āko is along the mauka extent of a pre-contact and early historic lowland area of salt marshes, fishponds, salt-making operations, taro pondfields, and dispersed settlement. This area was midway between the more extensive population and agricultural centers of Honolulu and Waikīkī. This area was used fairly extensively for burial interment, with many historic-era burials dating from the early 1850s' small pox epidemic. As Honolulu expanded toward Waikīkī, this low-lying area's land value increased. As early as the late 19th century, and continuing and increasing in the first half of the 20th century, this low-lying area was reclaimed through the deposition of numerous types of fill material. This reclamation often raised the land surface three to five feet and made the area suitable for more intensive residential and commercial development. Previous archaeological work through this portion of Kākā'āko has documented both historic and prehistoric burials, as well as pre-contact and historic archaeological deposits, preserved beneath these fill layers (Table 5-16).

Farther Koko Head, the alignment extends along Kona Street, connecting to Kapi'olani Boulevard near the Convention Center. Based on background research, there is reasonable potential for this portion of the alignment to encounter fishpond and pondfield remnants, burials, and historic archaeological remains. As the alignment extends along Kapi'olani Boulevard and mauka along University Avenue, the potential for archaeological impacts decreases; however, historic maps indicate this was an area of

extensive agriculture and dispersed settlement. At the UH Mānoa campus, the alignment could encounter remnants of pre-contact and historic agriculture and habitation.

Table 5-16. Hotel Street/Waimanu Street/Kapi'olani Boulevard

Author	Nature of Study	Location (TMK 1-)	Sites
Athens, et al., 1994	Inventory Survey	Kamake'e to Ke'eaumoku Streets (TMK 2-3)	50-80-14-4847 (one burial)
Chaffee and Spear, 1994	Assessment	Four Husten Street lots (TMK 2-7-009:013, 2-7-009:014, 2-7-010:008, 2-7-010:009)	None
Chiogioji and Hammatt, 1992a	Assessment	Iwilei parcel (TMK 1-5-008:001, 1-5-008:009, 1-5-008:011)	None
Chiogioji and Hammatt, 1992b	Assessment	5.33-acre parcel in the Kapi'olani Business District (TMK 1-2-3-009:001)	None
Clark and Gosser, 2005	Inventory Survey	Kapi'olani Avenue (TMK 2-3-003:075, 2-3-003:085, 2-3-003:086)	50-80-14-6636 (wetland pond)
Cleghorn, 1989	Excavation	China Gateway (TMK 2-1-003:015, 023, 024, 025)	None
Denham and Kennedy, 1993	Monitoring	Nu'uano-Capitol District (TMK 2-1-025:002)	50-80-14-4605 (one burial); 50-80-14-4606 (nine historic trash pits)
Denham, et al., 1992	Inventory Survey	Nu'uano (TMK 1-7-03:32)	None
Dye, 2002	Monitoring	Nu'uano-Capitol District (TMK 2-1-017:001, 2-1-017:002)	50-80-14-1307 (State Capitol/Grounds)
Elmore and Kennedy, 2001a		Chinatown, Honolulu (TMK 1-7-002:000, 1-7-003:000, 2-1-002:000)	50-80-14-5781 (one burial)
Erkelens, et al., 1994	Burial	Nu'uano-Kekaulike Park (TMK 1-7-003:032)	50-80-14-4875 (four burials)
Esh and Hammatt, 2004a	Monitoring	Ala Moana (TMK 2-3-006, 2-3-007, 2-3-010, 2-3-011, 2-3-012, 2-3-014 to 2-3-015, 2-3-035, 2-3-038, 2-4-003 to 2-4-004, 2-4-010, 2-4-012)	None
Esh and Hammatt, 2005	Burial Treatment Plan	Ala Wai Gateway (TMK 2-6-011:001, 2-6-011:002, 2-6-011:004, 2-6-011:032, 2-6-011:037, 2-6-011:040)	None
Esh and Hammatt, 2006	Monitoring	Pi'ikoi Street between Ala Moana Blvd. and Matlock Street	None
Goodwin, 1997	Inventory Survey	Nu'uano-Kekaulike Park (TMK 1-7-003:020, 021, 1-7-003:023, 1-7-003:024)	50-80-14-4875 (one burial)
Goodwin and Allen, 2005	Data Recovery	Nu'uano-Kekaulike Park (TMK 1-7-003:032)	50-80-14-4875 (one burial)

Author	Nature of Study	Location (TMK 1-)	Sites
Gosser, et al., 2006	Monitoring	Kapi'olani Avenue (TMK 2-3-003:075, 2-3-003:085, 2-3-003:086)	50-80-14-6636 (wetland pond)
Hammatt, 2006b	Inventory Survey	Ala Moana (TMK 2-3-038:001, 2-3-040:005, 2-3-040:007, 2-3-040:009, 2-3-040:011, 2-3-040:014, 2-3-040:016, 2-3-040:018)	50-80-14-6847 (artifact cache in box)
Hammatt, 2006c	Literature Review and Field Inspection	Kapi'olani Avenue (TMK 2-3-039:011)	None
Hammatt and Borthwick, 1989	Assessment	Hotel Street (TMK 2-1-017:007)	None
Heidel and Hammatt, 1994	Data Recovery	Nu'uau-Chinatown (TMK 1-7-003:014)	50-80-14-1346 (O'ahu Fire Stations)
Hurst and Allen [Pantaleo], 1992	Monitoring and Inventory Survey	Nu'uau-Harbor Court (TMK 2-1-002:016, 2-1-002:020, 2-1-002:056)	50-80-14-2426 (Mainly Historic Artifact Cache)
Kennedy, 1984	Investigations	Nu'uau (TMK 2-1-002:038, 2-1-002:039)	None
Kennedy, et al., 1994	Inventory Survey	Nu'uau-Kekaulike Park (TMK 1-7-003:032)	50-80-14-4587 (Pehu fishpond); 50-80-14-4588 (three burials)
Mann and Hammatt, 2002a	Monitoring	King Street Rehabilitation (TMK 1-7-, 2-1-)	50-80-14-6371 (one burial)
McGerty, et al., 1995	Assessment	Nu'uau-Chinatown (TMK 1-7-003:014, 1-7-003:015)	None
McGerty, et al, 1997	Data Recovery	Kalihi, Pālama (TMK 1-5-007:001, 1-5-007:014, 1-5-007:015, 1-5-007:018, 1-5-007:057, 1-5-007:058, 1-5-007:060 to :078)	50-80-14-5368 (Kūwili fishpond)
McIntosh and Cleghorn, 2005	Inventory Survey	Launiu Street (TMK 2-6-017:068, 2-6-017:070, 2-6-017:071, 2-6-017:072, 2-6-017:073)	50-80-14-6680 (<i>Io'i</i> , irrigated taro patch)
Monahan, 2005	Excavation	Kewalo (TMK 2-3-003:073, 2-3-003:096)	None
O'Hare, et al., 2003c	Inventory Survey	Parcel in Kewalo (TMK 2-3-010:028, 2-3-010:048, 2-3-010:050 to :056)	50-80-14-6636 pre-contact to early 20th-century land surface; 50-80-14-6637 (historic trash dump)
O'Leary and Hammatt, 2004	Monitoring	Kapi'olani Avenue (TMK 2-3-003)	None
O'Leary and Hammatt, 2006b	Inventory Survey	Moana Vista (TMK 2-3-003:072, 2-3-003:088, 2-3-003:102)	None
Pantaleo, 1989	Monitoring and Testing	Chinatown Gateway (TMK 2-1-003:015, 2-1-003:023, 2-1-003:024, 2-1-003:025)	50-80-14-2142 (historic artifact cache)
Riley, et al., 1995	Data Recovery	Nu'uau-Kekaulike Park (TMK 1-7-003:032)	50-80-14-4587 (Pehu fishpond); 50-80-14-4588 (three burials)

Author	Nature of Study	Location (TMK 1-)	Sites
Simons, et al., 1991	Monitoring	Honolulu town (TMK 2-1-017:001)	None
Tulchin and Hammatt, 2005	Inventory Survey	Ko'olani Condominiums (TMK 2-3-004:073, 2-3-005:027, 2-3-006:014, 2-3-007:002)	None
West, et al., 2002	Monitoring	Nu'uano, Liliha (TMK 1-5-006, 1-5-007, 1-5-008, 1-7-026, 1-7-027)	Historic Cultural Deposit, newly identified deposit of 50-80-14-5942 (Honolulu Rapid Transit and Land Company Trolley)
Winieski and Hammatt, 2000a	Monitoring	Kākā'āko ID-4 (TMK 2-3-002, 2-3-003, 2-3-004, 2-3-005)	50-80-14-4498 ('auwai and lo'i remnants); 50-80-14-5598 (two burials)
Wolforth and Haun, 1996	Inventory Survey	Mānoa, Pālolo-KP Trans (TMK 2-7-, 2-8-, 2-9-, 3-2-, 3-3-, 3-4)	50-80-14-4266 (burials); 50-80-14-4498 (fishpond); 50-80-14-5463; 50-80-14-1352; 50-80-14-9749

Hotel Street/Kawaiaha'o Street/Kapi'olani Boulevard

This alignment is sufficiently similar to the Hotel Street/Waimanu Street/Kapi'olani Boulevard alignment described immediately above that it does not merit further detailed discussion. This alignment passes through the same archaeologically sensitive areas. Accordingly, the Hotel Street/Kawaiaha'o Street/Kapi'olani Boulevard alignment's potential to encounter archaeological resources is rated high for all three archaeological impact categories (Tables 5-17 and 5-18).

Table 5-17. Hotel Street/Kawaiaha'o Street/Kapi'olani Boulevard, Excluding Tunnel

Author	Nature of Study	Location (TMK 1-)	Sites
Athens, et al., 1994	Inventory Survey	Kamake'e to Ke'eaumoku Streets (TMK 2-3)	50-80-14-4847 (one burial)
Chaffee and Spear, 1994	Assessment	Four Hausten Street lots (TMK 2-7-009:013, 2-7-009:014, 2-7-010:008, 2-7-010:009)	None
Chiogioji and Hammatt, 1992a	Assessment	Iwilei parcel (TMK 1-5-008:001, 1-5-008:009, 1-5-008:011)	None
Chiogioji and Hammatt, 1992b	Assessment	5.33-acre parcel in the Kapi'olani Business District (TMK 1-2-3-009:001)	None
Cleghorn, 1989	Excavation	China Gateway (TMK 2-1-003:015, 023, 024, 025)	None
Denham and Kennedy, 1993	Monitoring	Nu'uano-Capitol District (TMK 2-1-025:002)	50-80-14-4605 (one burial; multiple historic features); 50-80-14-4606 (nine historic trash pits)
Denham, et al., 1992	Inventory Survey	Nu'uano (TMK 1-7-003:032)	None

Author	Nature of Study	Location (TMK 1-)	Sites
Dye, 2002	Monitoring	Nu'uanu-Capitol District (TMK 2-1-017:001, 2-1-017:002)	Historic in-fill pit, newly identified feature of 50-80-14-1307 (State Capitol/Grounds)
Elmore and Kennedy, 2001a		Chinatown, Honolulu (TMK 1-7-002:000, 1-7-003:000, 2-1-002:000)	50-80-14-5781 (one burial)
Erkelens, et al., 1994	Burial	Nu'uanu-Kekaulike Park (TMK 1-7-003:032)	Four burials, newly identified for 50-80-14-4875 (Kekaulike Diamond Head Block Project)
Esh and Hammatt, 2004a	Monitoring	Ala Moana (TMK 2-3-006, 2-3-007, 2-3-010, 2-3-011, 2-3-012, 2-3-014 to 2-3-015, 2-3-035, 2-3-038, 2-4-003 to 2-4-004, 2-4-010, 2-4-012)	None
Esh and Hammatt, 2005	Burial Treatment Plan	Ala Wai Gateway (TMK 2-6-011:001, 2-6-011:002, 2-6-011:004, 2-6-011:032, 2-6-011:037, 2-6-011:040)	None
Esh and Hammatt, 2006	Monitoring	Pi'ikoi Street between Ala Moana Blvd. and Matlock Street	None
Goodwin, 1997	Inventory Survey	Nu'uanu-Kekaulike Park (TMK 1-7-003:020, 021, 1-7-003:023, 1-7-003:024)	Cultural deposit (primarily historic) with one burial, newly identified for 50-80-14-4875 (Kekaulike Diamond Head Block Project)
Goodwin and Allen, 2005	Data Recovery	Nu'uanu-Kekaulike Park (TMK 1-7-003:032)	Cultural deposit (primarily historic) with one burial, newly identified for 50-80-14-4875 (Kekaulike Diamond Head Block Project)
Hammatt and Borthwick, 1989	Assessment	Hotel Street (TMK 2-1-017:007)	None
Hammatt, 2006b	Inventory Survey	Ala Moana (TMK 2-3-038:001, 2-3-040:005, 2-3-040:007, 2-3-040:009, 2-3-040:011, 2-3-040:014, 2-3-040:016, 2-3-040:018)	50-80-14-6847 (historic artifact cache in box)
Heidel and Hammatt, 1994	Data Recovery	Nu'uanu-Chinatown (TMK 1-7-003:014)	None
Hurst and Allen [Pantaleo], 1992	Monitoring and Inventory Survey	Nu'uanu-Harbor Court (TMK 2-1-002:016, 2-1-002:020, 2-1-002:056)	50-80-14-2426 (mainly historic artifact cache)
Kawachi, 1991	Monitoring	Kākā'āko (TMK 2-1-048:008)	50-80-14-1604 (one burial)
Kennedy, 1984	Investigations	Nu'uanu (TMK 2-1-002:038, 2-1-002:039)	None
Kennedy, et al., 1994	Inventory Survey	Nu'uanu-Kekaulike Park (TMK 1-7-003:032)	50-80-14-4587 (Pehu fishpond); 50-80-14-4588 (pre/post-historic cultural deposit with three burials)

Author	Nature of Study	Location (TMK 1-)	Sites
Mann and Hammatt, 2002a	Monitoring	King Street Rehabilitation (TMK 1-7-, 2-1-)	50-80-14-6371 (one burial)
McGerty, et al., 1995	Assessment	Nu'uanu-Chinatown (TMK 1-7-003:014, 1-7-003:015)	None
McGerty, et al., 1997	Data Recovery	Kalihi, Pālama (TMK 1-5-007:001, 1-5-007:014, 1-5-007:015, 1-5-007:018, 1-5-007:057, 1-5-007:058, 1-5-007:060 to :078)	50-80-14-5368 (Kūwili fishpond)
McIntosh and Cleghorn, 2005	Inventory Survey	Launiu Street (TMK 2-6-017:068, 2-6-017:070, 2-6-017:071, 2-6-017:072, 2-6-017:073)	50-80-14-6680 (<i>lo'i</i> , irrigated taro patch)
O'Hare, et al., 2003c	Inventory Survey	Parcel in Kewalo (TMK 2-3-010:028, 2-3-010:048, 2-3-010:050 to :056)	50-80-14-6636 pre-contact to early 20th century land surface; 50-80-14-6637 (historic trash dump)
O'Leary and Hammatt, 2004	Monitoring	Kapi'olani Avenue (TMK 2-3-003)	None
Pantaleo, 1989	Monitoring and Testing	Chinatown Gateway (TMK 2-1-003:015, 2-1-003:023, 2-1-003:024, 2-1-003:025)	50-80-14-2142 (historic artifact cache)
Pfeffer, et al., 1993	Literature Review	Kākā'āko ID-1 (TMK 2-1-029, 2-1-030, 2-1-031, 2-1-032, 2-1-046, 2-1-047, 2-1-048, 2-1-051, 2-1-054, 2-1-055)	50-80-14-4534 (Kawaiaha'o Cemetery burials—116 burials); 50-80-14-4531 (Honuakaha Smallpox Cemetery—31 burials); 50-80-14-4532 (one isolated burial); 50-80-14-4533 (one isolated burial)
Riley, et al., 1995	Data Recovery	Nu'uanu-Kekaulike Park (TMK 1-7-003:032)	50-80-14-4587 (Pehu fishpond); 50-80-14-4588 (pre/post-historic cultural deposit with three burials)
Schilz, 1991b	Resource Evaluation	Kākā'āko (TMK 2-1-054:8-19)	None
Simons, et al., 1991	Monitoring	Honolulu town (TMK 2-1-017:001)	None
Tulchin and Hammatt, 2005	Inventory Survey	Ko'olani Condominiums (TMK 2-3-004:073, 2-3-005:027, 2-3-006:014, 2-3-007:002)	None
West, et al., 2002	Monitoring	Nu'uanu, Liliha (TMK 1-5-006, 1-5-007, 1-5-008, 1-7-026, 1-7-027)	Historic cultural deposit, newly identified deposit of 50-80-14-5942 (Honolulu Rapid Transit and Land Company Trolley)
Winieski and Hammatt, 2000a	Monitoring	Kākā'āko ID-4 (TMK 2-3-002, 2-3-003, 2-3-004, 2-3-005)	50-80-14-4498 (<i>'auwai</i> and <i>lo'i</i> remnants); 50-80-14-5598 (two historic burials)

Author	Nature of Study	Location (TMK 1-)	Sites
Winieski and Hammatt, 2000b	Monitoring	Kākā'āko ID-3 (TMK 2-1-030:000, 2-1-031:000, 2-1-032:000, 2-1-044:000, 2-1-046:000, 2-1-047:000, 2-1-048:000, 2-1-050:000, 2-1-051:000, 2-1-052:000, 2-1-054:000)	50-80-14-4380 (nine burials); 50-80-14-5820(11 burials)
Wolforth and Haun, 1996	Inventory Survey	Mānoa, Pālolo-KP Trans (TMK 2-7-, 2-8-, 2-9-, 3-2-, 3-3-, 3-4)	50-80-14-4266 (one burial site); 50-80-14-4498 (fishpond); 50-80-14-5463 (walls and terraces); 50-80-14-1352 (University of Hawai'i); 50-80-14-9749 (Church of the Crossroads)

Table 5-18. Hotel Street/Kawaiha'e Street/Kapi'olani Boulevard, Tunnel Only

Author	Nature of Study	Location (TMK 1-)	Sites
Bevan, et al., 2004	Monitoring	IMAX Theater (TMK 2-1-033:007)	None
Chaffee and Spear, 1994	Assessment	Four Hausten Street lots (TMK 2-7-009:013, 2-7-009:014; 2-7-010:008, 2-7-010:009)	None
Chiogioji, et al., 1991	Investigations	Hawai'i Library (TMK 2-1-025:001)	14 features and scattered historic artifacts, newly found in 50-80-14-9959 (Hawai'i State Library/Grounds)
Denham and Kennedy, 1993	Monitoring	Nu'uano-Capitol District (TMK 2-1-025:002)	50-80-14-4605 (one burial; multiple historic features); 50-80-14-4606 (nine historic trash pits)
Mann and Hammatt, 2002a	Monitoring	King Street Rehabilitation (TMK 1-7-; 2-1-)	50-80-14-6371 (one burial)
Pfeffer, et al., 1993	Literature Review	Kākā'āko ID-1 (TMK 2-1-029, 2-1-030, 2-1-031, 2-1-032, 2-1-046, 2-1-047, 2-1-048, 2-1-051, 2-1-054, 2-1-055)	50-80-14-4534 (Kawaiha'e Cemetery burials—116 burials); 50-80-14-4531 (Honuakaha Smallpox Cemetery—31 burials); 50-80-14-4532 (one isolated burial); 50-80-14-4533 (one isolated burial)
Rosendahl, 1971	Data Recovery	Nu'uano-'Iolani Palace (TMK 2-1-025:002)	Scattered historic artifacts, newly found in 50-80-14-9912 ('Iolani Palace)

Nimitz Highway/Queen Street/Kapi'olani Boulevard

This alignment's potential to encounter archaeological resources is rated high for all three archaeological impact categories. For the most part, the following discussion also pertains to the Nimitz Highway/Halekauwila Street/Kapi'olani Boulevard alignment because these two coastal-most alignments of Section V are so similar.

From the former pondfields, fishponds, and settlement remnants in Iwilei and along the mouth of Nu‘uanu Stream (the pre-contact settlement of Kou), the alignment passes along the margins of Honolulu Harbor on the Nimitz Highway. Previous archaeological research indicates that this portion of the Nimitz Highway is at the boundary of fill lands and former pre-contact and early historic harbor shoreline. This shoreline was the site of the early development of Honolulu, where traditional chiefly residences gave way to early western commercial and residential buildings and structures, which were followed by late 19th century and early 20th century buildings and structures. A number of burials have been documented in the vicinity associated with the area’s early historic land use (Table 5-19).

At the Merchant Historic District, the alignment branches onto Queen Street from the Nimitz Highway. There has been little previous archaeological research in this area; however, a burial was recorded near the corner of Mililani and Queen Streets. This portion of Downtown can reasonably be expected to contain historic deposits related to development of Honolulu in the 19th century.

Numerous burials have been recorded along Queen Street as it extends through Kākā‘āko. Preserved beneath the area’s massive fill deposits, these burials include historic coffin burials, many related to the early 1850s smallpox epidemic. More than 100 historic burials were removed from beneath Queen Street adjacent to the Kawaiaha‘o Street Cemetery. Near the corner of Queen and South Streets, the historic Honuakaha Cemetery contains hundreds of unmarked graves; the boundaries of these burial deposits are poorly defined and could extend into Queen Street. Isolated burials have been recorded along Kamake‘e Street in the vicinity of Queen Street. Thirty mostly prehistoric coffin burials were documented in the Queen Street Extension, immediately Koko Head of Queen Street (Table 5-19).

The alignment through Kākā‘āko has the potential to encounter former agricultural features and fishpond remnants. A recent investigation immediately *makai* of the Queen Street Extension documented fishpond remnants, and pre-contact habitation deposits and burials associated with large Jaucas Sand deposits (Table 5-19).

Further Koko Head, the alignment extends along Kona Street, connecting to Kapi‘olani Boulevard near the Convention Center. Based on background research, there is reasonable potential for this portion of the alignment to encounter fishpond and pondfield remnants, burials, and historic archaeological remains. As the alignment extends along Kapi‘olani Boulevard and mauka along University Avenue, the potential for archaeological impacts decreases; however, historic maps do indicate this was an area of extensive agriculture and dispersed settlement. At the University of Hawai‘i-Mānoa campus, the alignment could encounter remnants of pre-contact and historic agriculture and habitation.

Table 5-19. Nimitz Highway/Queen Street/Kapi'olani Boulevard

Author	Nature of Study	Location (TMK 1-)	Sites
Athens, et al., 1994	Inventory Survey	Kamake'e to Ke'eaumoku Streets (TMK 2-3)	50-80-14-4847 (one burial)
Bell, et al., 2006	Inventory Survey	Kākā'āko-Ward Village (TMK 2-3-005:013-017, 2-3-005:022, 2-3-005:023)	CSH1 (historic/prehistoric cultural horizon with five burials); CSH2 (traditional Hawaiian culture layer with six burials); CSH3 (pond remnant);
Bush, et al., 2005	Monitoring	Kākā'āko (TMK 2-3-004, 2-3-005, 2-3-006, 2-3-007)	Multiple historic trash pits; 16 historic coffin burials; two burials; site currently under review by SHPD
Chaffee and Spear, 1994	Assessment	Four Hausten Street lots (TMK 2-7-009:013, 2-7-009:014, 2-7-010:008, 2-7-010:009)	None
Chiogioji and Hammatt, 1992a	Assessment	Iwilei parcel (TMK 1-5-008:001, 1-5-008:009, 1-5-008:011)	None
Chiogioji and Hammatt, 1992b	Assessment	5.33-acre parcel in the Kapi'olani Business District (TMK 1-2-3-009:001)	None
Cordy and Hammatt, 2005	Monitoring	Punchbowl Street (TMK 2-1-015, 2-1-025, 2-1-025, 2-1-027, 2-1-029, 2-1-031, 2-1-032, 2-1-033)	None
Denham and Kennedy, 1993	Monitoring	Nu'uuanu-Capital District (TMK 2-1-025:002)	50-80-14-4605 (one burial; multiple historic features); 50-80-14-4606 (nine historic trash pits)
Douglas, 1991	Burial	Kākā'āko (TMK 2-1-051)	Six newly discovered burials for 50-80-14-4380
Dunn, et al., 1993	Inventory Survey	Nu'uuanu Court Project, Land of Nu'uuanu (TMK 2-1-002:026)	50-80-14-2456 (pre- and post-contact cultural deposits)
Esh and Hammatt, 2004a	Monitoring	Ala Moana (TMK 2-3-006, 2-3-007, 2-3-010, 2-3-011, 2-3-012, 2-3-014 to 2-3-015, 2-3-035, 2-3-038, 2-4-003 to 2-4-004, 2-4-010, 2-4-012)	None
Esh and Hammatt, 2005	Burial Treatment Plan	Ala Wai Gateway (TMK 2-6-011:001, 2-6-011:002, 2-6-011:004, 2-6-011:032, 2-6-011:037, 2-6-011:040)	None
Esh and Hammatt, 2006	Monitoring	Pi'ikoi Street between Ala Moana Blvd. and Matlock Street	None
Goodwin, et al., 1992, 1996	Data Recovery	Marin Tower Property, Nu'uuanu (TMK 1-7-002:003, 1-7-002:004, 1-7-002:005, 1-7-002:042)	50-80-14-4494 (pre- and post-contact cultural deposits with 15 burials)

Author	Nature of Study	Location (TMK 1-)	Sites
Hammatt, 2006b	Inventory Survey	Ala Moana (TMK 2-3-038:001, 2-3-040:005, 2-3-040:007, 2-3-040:009, 2-3-040:011, 2-3-040:014, 2-3-040:016, 2-3-040:018)	50-80-14-6847 (Historic artifact cache in box)
Hammatt and Pfeffer, 1993	Inventory Survey	Pauoa-Honolulu Brewery (TMK 2-1-031:021)	50-14-9917 (American Brewery Co. lot); 50-80-14-3712 (Honuakaha Cemetery)
Hurst, 1991	Preliminary Data Recovery	Nu'uuanu-Harbor Court (TMK 2-1-002:016, 2-1-002:020, 2-1-002:056)	Historic deposits
Hurst and Allen, 1992	Monitoring and Inventory Survey	Nu'uuanu-Harbor Court (TMK 2-1-002:016, 2-1-002:020, 2-1-002:056)	50-80-14-2426 (mainly historic artifact cache)
Kawachi, 1991	Monitoring	Kākā'āko (TMK 2-1-048:008)	50-80-14-1604 (one Burial)
Landrum and Dixon, 1992	Mitigation	River-Nimitz Project, Nu'uuanu (TMK 1-7-002:027)	50-80-14-4192 (historic trash pits; one burial)
Lebo, 2002	Data Recovery	Nu'uuanu-Harbor Court (TMK 2-1-002:016, 2-1-002:020, 2-1-002:056)	50-80-14-2456 (pre/post-contact cultural deposit with five burials)
Lebo and McGuirt, 2000b	Data Recovery	800 Nu'uuanu (TMK 1-7-002:002)	50-80-14-5496 (19th-20th century cultural deposits)
Lebo and Rosendahl, 2002	Data Recovery	Nu'uuanu-Harbor Court (TMK 2-1-002:016, 2-1-002:020, 2-1-002:056)	50-80-14-2456 (pre/post-contact cultural deposit with five burials)
Mann and Hammatt, 2002a	Monitoring	King Street Rehabilitation (TMK 1-7-, 2-1-)	50-80-14-6371 (one burial)
McDermott and Mann, 2001	Inventory Survey	Nimitz Highway Water System (TMK 1-5-008, 1-7-001, 2-1-002)	50-80-14-5966 (Kawa fishpond)
McGerty, et al., 1997	Data Recovery	Kalihi, Pālama (TMK 1-5-007:001, 1-5-007:014, 1-5-007:015, 1-5-007:018, 1-5-007:057, 1-5-007:058, 1-5-007:060 to :078)	50-80-14-5368 (Kūwili fishpond)
O'Hare, et al., 2003a	Data Recovery Plan	Nimitz Highway (TMK 1-5-008, 1-7-001, 2-1-002)	50-80-14-5966 (Kawa fishpond); due to gasoline contamination of the soil, no samples from the fishpond could be collected
O'Leary and Hammatt, 2004	Monitoring	Kapi'olani Avenue (TMK 2-3-003)	None
Perzinski and Hammatt, 2004	Inventory Survey	Kapālama-Kākā'āko Fire Station (TMK 2-1-031:015, 2-1-031:018)	50-80-14-1346 (Kākā'āko Fire Station)
Perzinski, et al., 2005	Inventory Survey	(TMK 2-1-048:008)	50-80-14-1604 (additional disarticulated human remains); 50-80-14-6766 (remnants of historic occupation)

Author	Nature of Study	Location (TMK 1-)	Sites
Pfeffer, et al., 1993	Literature Review	Kākā'āko ID-1 (TMK 2-1-029, 2-1-030, 2-1-031, 2-1-032, 2-1-046, 2-1-047, 2-1-048, 2-1-051, 2-1-054, 2-1-055)	50-80-14-4534 (Kawaiha'o Cemetery burials—116 burials); 50-80-14-4531 (Honuakaha Smallpox Cemetery—31 burials); 50-80-14-4532 (one isolated burial); 50-80-14-4533 (one isolated burial)
Putzi and Dye, 2004	Monitoring	Honolulu town (TMK 2-1-025:003)	50-80-14-9908 (historic artifacts associated with Ali'iōlani Hale)
Schilz, 1991b	Resource Evaluation	Kākā'āko (TMK 2-1-054:008 to :019)	None
Souza, et al., 2002	Monitoring	Kākā'āko ID-7 (TMK 2-1-058, 2-3-001, 2-3-002, 2-3-003, 2-3-004, 2-3-005)	50-80-14-6376 (one burial); 50-80-14-6377 (one burial); 50-80-14-6378 (one burial)
Tulchin and Hammatt, 2005	Inventory Survey	Ko'olani Condominiums (TMK 2-3-004:073, 2-3-005:027, 2-3-006:014, 2-3-007:002)	None
West, et al., 2002	Monitoring	Nu'uuanu, Liliha (TMK 1-5-006, 1-5-007, 1-5-008, 1-7-026, 1-7-027)	Historic cultural deposit, newly identified deposit of 50-80-14-5942 (Honolulu Rapid Transit and Land Company Trolley)
Winieski and Hammatt, 2000a	Monitoring	Kākā'āko ID-4 (TMK 2-3-002, 2-3-003, 2-3-004, 2-3-005)	50-80-14-4498 ('auwai and lo'i remnants); 50-80-14-5598 (two historic burials)
Winieski and Hammatt, 2000b	Monitoring	Kākā'āko ID-3 (TMK 2-1-030:000, 2-1-031:000, 2-1-032:000, 2-1-044:000, 2-1-046:000, 2-1-047:000, 2-1-048:000, 2-1-050:000, 2-1-051:000, 2-1-052:000, 2-1-054:000)	50-80-14-4380 (nine burials); 50-80-14-5820(11 burials)
Winieski and Hammatt, 2001a	Monitoring	Nimitz Highway (TMK 2-1-002, 2-1-013, 2-1-014, 2-1-015, 2-1-016, 2-1-025, 2-1-027, 2-1-029, 2-1-030, 2-1-031:, 2-1-032, 7-2-003, 7-2-003)	50-80-14-5942 (remnant of Trolley Rail)
Winieski, et al., 1996	Burial	Pauoa-Honolulu Brewery (TMK 2-1-031:021)	50-80-14-3712 (American Brewery Co.); 50-80-14-9917 (Honuakaha Cemetery)
Wolforth and Haun, 1996	Inventory Survey	Mānoa, Pālolo-KP Trans (TMK 2-7-, 2-8-, 2-9-, 3-2-, 3-3-, 3-4)	50-80-14-4266 (one burial site); 50-80-14-4498 (fishpond); 50-80-14-5463 (walls and terraces); 50-80-14-1352 (University of Hawai'i); 50-80-14-9749 (Church of the Crossroads)

Nimitz Highway/Halekauwila Street/Kapi'olani Boulevard

This alignment is sufficiently similar to the Nimitz Highway/Queen Street/Kapi'olani Boulevard alignment, described immediately above, that it does not merit further detailed discussion. This alignment passes through the same archaeologically sensitive areas, and therefore the potential to encounter archaeological resources is rated high for all three impact categories (Table 5-20).

Table 5-20. Nimitz Highway/Halekauwila Street/Kapi'olani Boulevard

Author	Nature of Study	Location	Sites
Athens, 1986	Monitoring	Judiciary Parking Garage (TMK 2-1-030:003, 2-1-030:004, 2-1-030:038, 2-1-030:039)	50-80-14-3984 (historic deposit)
Athens, et al., 1994	Inventory Survey	Kamake'e to Ke'eaumoku Streets (TMK 2-3)	50-80-14-4847 (one burial)
Avery and Kennedy, 1993	Monitoring, Burial Report	South Street (TMK 2-1-031:020)	50-80-14-3712 (Honuakaha Cemetery)
Bell, et al., 2006	Inventory Survey	Kākā'āko-Ward Village (TMK 2-3-005:013-017, 2-3-005:022, 2-3-005:023)	CSH-1 (pre-/post-historic cultural horizon and five burials); CSH-2 (traditional Hawaiian culture layer with six burials; CSH-3- (pond remnant)
Borthwick and Hammatt, 2001	Monitoring	Kākā'āko Improvement District 6 (TMK 2-1-058, 2-3-001, 2-3-002, 2-3-003, 2-3-004, 2-3-005)	No finds over former tidal flats
Bush, et al., 2005	Monitoring	Kākā'āko (TMK 2-3-004, 2-3-005, 2-3-006, 2-3-007)	Multiple historic trash pits; 16 historic coffin burials; two burials
Chaffee and Spear, 1994	Assessment	Four Hausten Street lots (TMK 2-7-009:013, 2-7-009:014, 2-7-010:008, 2-7-010:009)	None
Chiogioji and Hammatt, 1992a	Assessment	Iwilei parcel (TMK 1-5-008:001, 1-5-008:009, 1-5-008:011)	None
Chiogioji and Hammatt, 1992b	Assessment	5.33-acre parcel in the Kapi'olani Business District (TMK 1-2-3-009:001)	None
Clark, 1987	Monitoring	Capitol (TMK 2-1-031:023)	Seven burials, newly found in 50-80-14-2963
Cordy and Hammatt, 2005	Monitoring	Punchbowl Street (TMK 2-1-015, 2-1-025, 2-1-026, 2-1-027, 2-1-029, 2-1-030, 2-2-032, 2-1-033)	None
Dunn, et al., 1993	Inventory Survey	Nu'uānu Court Project, Land of Nu'uānu (TMK 2-1-002:026)	50-80-14-2456 (pre/post-contact cultural deposits)
Esh and Hammatt, 2004a	Monitoring	Ala Moana (TMK 2-3-006, 2-3-007, 2-3-010, 2-3-011, 2-3-012, 2-3-014 to 2-3-015, 2-3-035, 2-3-038, 2-4-003 to 2-4-004, 2-4-010, 2-4-012)	None

Author	Nature of Study	Location	Sites
Esh and Hammatt, 2005	Burial Treatment Plan	Ala Wai Gateway (TMK 2-6-011:001, 2-6-011:002, 2-6-011:004, 2-6-011:032, 2-6-011:037, 2-6-011:040)	None
Goodwin, et al., 1992, 1996	Data Recovery	Marin Tower Property, Nu'uauu (TMK 1-7-002:003, 1-7-002:004, 1-7-002:005, 1-7-002:042)	50-80-14-4494 (pre/post-contact cultural deposits with 15 burials)
Hammatt, 2006b	Inventory Survey	Ala Moana (TMK 2-3-038:001, 2-3-040:005, 2-3-040:007, 2-3-040:009, 2-3-040:011, 2-3-040:014, 2-3-040:016, 2-3-04:018)	50-80-14-6847 (historic artifact cache in box)
Hammatt and Chiogioji, 1994	Assessment	Kākā'āko (TMK 2-1-029:001, 2-1-030:001, 2-1-030:014, 2-1-030:015, 2-1-030:017, 2-1-051: 007, 2-1-052:002 to 007, 2-1-053:004, 2-1-053:005, 2-1-053:027, 2-1-054:001, 2-1-054:022, 2-1-054:025, 2-1-054:027, 2-1-054:028, 2-1-054:032, 2-1-055:001, 2-1-055:002, 2-1-055:003, 2-1-055:006, 2-1-055:018, 2-1-055:021, 2-1-055:026, 2-1-055:032, 2-1-055:033, 2-1-055:034, 2-1-055:035, 2-1-055:038, 2-1-056:002, 2-1-056:003, 2-1-056:004, 2-1-056:007, 2-1-056:008, 2-1-059:001, 2-1-059:003, 2-1-059:004, 2-1-059:005, 2-1-059:006, 2-1-059:011, 2-1-059:012, 2-1-059:013)	None
Hammatt and Pfeffer, 1993	Inventory Survey	Pauoa-Honolulu Brewery (TMK 2-1-031:021)	50-14-9917 (American Brewery Co. lot); 50-80-14-3712 (Honuakaha Cemetery)
Heidel and Hammatt, 1994	Data Recovery	Nu'uauu-Chinatown (TMK 1-7-003:014)	None
Landrum and Dixon, 1992	Mitigation	River-Nimitz Project, Nu'uauu (TMK 1-7-002:027)	50-80-14-4192 (historic trash pits; one burial)
Lebo and McGuirt, 2000b	Data Recovery	800 Nu'uauu (TMK 1-7-002:002)	50-80-14-5496 (19th-20th century cultural deposits)
Lebo and Rosendahl, 2002	Data Recovery	Nu'uauu-Harbor Court (TMK 2-1-002:016, 2-1-002:020, 2-1-002:056)	50-80-14-2456 (pre/post-contact cultural deposit with five burials)
Leidemann, 1988	Historic Artifact Analysis	Nu'uauu-Capitol District (TMK 2-1-030)	50-80-14-1973 (historic artifacts)
Mann and Hammatt, 2002a	Monitoring	King Street Rehabilitation (TMK 1-7-, 2-1-)	50-80-14-6371 (one burial)

Author	Nature of Study	Location	Sites
McDermott and Mann, 2001	Inventory Survey	Nimitz Highway Water System (TMK 1-5-008, 1-7-001, 2-1-002)	50-80-14-5966 (Kawa fishpond)
McGerty, et al., 1997	Data Recovery	Kalihi, Pālama (TMK 1-5-007:001, 1-5-007:014, 1-5-007:015, 1-5-007:018, 1-5-007:057, 1-5-007:058, 1-5-007:060 to 1-5-007:078)	50-80-14-5368 (Kūwili fishpond)
O'Hare, et al., 2003a	Data Recovery Plan	Nimitz Highway (TMK 1-5-008, 1-7-001, 2-1-002)	50-80-14-5966 (Kawa fishpond); due to gasoline contamination of the soil, no samples from the fishpond could be collected
O'Hare, et al., 2003c	Inventory Survey	Parcel in Kewalo (TMK 2-3-010:028, 2-3-010:048, 2-3-010:050 to :056)	50-80-14-6636 pre-contact to early 20th century land surface; 50-80-14-6637 (historic trash dump)
O'Leary and Hammatt, 2004	Monitoring	Kapi'olani Avenue (TMK 2-3-003)	None
Pfeffer, et al., 1993	Literature Review	Kākā'āko ID-1 (TMK 2-1-029, 2-1-030, 2-1-031, 2-1-032, 2-1-046, 2-1-047, 2-1-048, 2-1-051, 2-1-054, 2-1-055)	50-80-14-4534 (Kawaiha'o Cemetery burials—116 burials); 50-80-14-4531 (Honuakaha Smallpox Cemetery—31 burials); 50-80-14-4532 (one isolated burial); 50-80-14-4533 (one isolated burial)
Souza, et al., 2002	Monitoring	Kākā'āko ID-7 (TMK 2-1-058, 2-3-001, 2-3-002, 2-3-003, 2-3-004, 2-3-005)	50-80-14-6376 (one burial); 50-80-14-6377 (one burial); 50-80-14-6378 (one burial)
Tulchin and Hammatt, 2005	Inventory Survey	Ko'olani Condominiums (TMK 2-3-004:073, 2-3-005:027, 2-3-006:014, 2-3-007:002)	None
West, et al., 2002	Monitoring	Nu'uauu, Liliha (TMK 1-5-006, 1-5-007, 1-5-008, 1-7-026, 1-7-027)	Historic cultural deposit, newly identified deposit of 50-80-14-5942 (Honolulu Rapid Transit and Land Company Trolley)
Winieski and Hammatt, 2000a	Monitoring	Kākā'āko ID-4 (TMK 2-3-002, 2-3-003, 2-3-004, 2-3-005)	50-80-14-4498 ('auwai and lo'i remnants); 50-80-14-5598 (two historic burials)
Winieski and Hammatt, 2000b	Monitoring	Kākā'āko ID-3 (TMK 2-1-030:000, 2-1-031:000, 2-1-032:000, 2-1-044:000, 2-1-046:000, 2-1-047:000, 2-1-048:000, 2-1-050:000, 2-1-051:000, 2-1-052:000, 2-1-054:000)	50-80-14-4380 (nine burials); 50-80-14-5820 (11 burials)
Winieski and Hammatt, 2001a	Monitoring	Nimitz Hwy. (TMK 2-1-002, 2-1-013, 2-1-014, 2-1-015, 2-1-016, 2-1-025, 2-1-027, 2-1-029, 2-1-030, 2-1-031, 2-1-032, 7-2-003, 7-2-003)	50-80-14-5942 (remnant of trolley rail)

Author	Nature of Study	Location	Sites
Winieski, et al., 1996	Burial	Pauoa-Honolulu Brewery (TMK 2-1-031:021)	50-80-14-3712 (American Brewery Co.); 50-80-14-9917 (Honuakaha Cemetery)
Wolforth and Haun, 1996	Inventory Survey	Mānoa, Pālolo-KP Trans (TMK 2-7-, 2-8-, 2-9-, 3-2-, 3-3-, 3-4-)	50-80-14-4266 (one burial site); 50-80-14-4498 (fishpond); 50-80-14-5463 (walls and terraces); 50-80-14-1352 (UH); 50-80-14-9749 (Church of the Crossroads)
Yent, 1985		Honolulu Ironworks site, Kākā'āko Improvement District 1 (TMK 2-1-029:001)	50-80-14-2918 - Five burials associated with Ka'akaukui Cemetery

Waikīkī Spur

The Waikīkī Spur is rated high for all three categories of impacts to archaeological resources. Based on background research, the Waikīkī Spur has one of the highest potentials to encounter archaeological resources of all the proposed alignments.

Archaeological evidence and traditional accounts indicate that Waikīkī has been an intensively used agricultural and population center for the last 700 years. The extensive archaeological record that resulted from this intensive land use, both pre-contact and historic extending into the early 20th century, was “capped” by the fill sediments from the construction of the Ala Wai Canal in the 1920s. Modern Waikīkī was constructed on top of these fill sediments. Abundant previous archaeological research in Waikīkī over the last 30 years has documented that Waikīkī’s archaeological record is preserved beneath this modern development (Table 5-21). There has been significantly less past archaeological research along Kūhiō Avenue than the more *makai* portions of Waikīkī, particularly in the vicinity of Kalākaua Avenue. Nevertheless, the potential for encountering archaeological resources is rated as high.

Based on previous archaeological research in the vicinity, historic and pre-contact burials are preserved beneath the fill sediments. Also preserved are the remnants of pre-contact, traditional Hawaiian land use, including agricultural and aquacultural infrastructure, and subsurface cultural layers related to habitation and other land use. Preserved low-energy alluvial deposits may contain important information regarding human-induced environmental change as Waikīkī developed. Land Commission Award records and historic maps indicate that 19th-century land use continued intensively, with fishponds shown along the Waikīkī Spur alignment.

Table 5-21. Waikīkī Spur

Author	Nature of Study	Location (TMK 1-)	Sites
Beardsley and Kaschko, 1997	Monitoring	Waikīkī (TMK 2-6-023:025)	None
Bush, et al., 2002b	Monitoring	Anti-Crime Lighting, Phase II (TMK 2-6-001, 2-6-002, 2-6-003, 2-6-005, 2-6-006, 2-6-015, 2-6-016, 2-6-018, 2-6-019, 2-6-022, 2-6-023, 2-6-026, 2-6-027)	50-80-14-5864 (one burial); 50-80-14-5856 (one burial); 50-80-14-5860 (two burials); 50-80-14-5940
Bush, et al., 2003b	Monitoring	Waikīkī (TMK 2-6-022:038)	None
Calis, 2002	Monitoring	Waikīkī (TMK 2-6-027:025)	None
Chiogioji and Hammatt, 1991	Assessment	Waikīkī (TMK 2-1-050:013, 2-1-050:014, 2-1-050:015, 2-1-050:053, 2-1-050:063, 2-1-050:064)	None
Chiogioji and Hammatt, 2004	Literature Review	Waikīkī (TMK 2-6-013:001, 2-6-013:003, 2-6-013:004, 2-6-013:007, 2-6-013:008, 2-6-013:009, 2-6-013:011, 2-6-013:012)	None
Cleghorn, 1996b	Inventory Survey	Kalākaua Plaza Phase I (TMK 2-6-016:023, 2-6-016:025, 2-6-016:026, 2-6-016:028, 2-6-016:061, 2-6-016:069)	None
Davis, 1989	Reconnaissance Survey	Ft. DeRussy (TMK 2-6-005:001)	50-80-14-0058, 0062, 0064, 0065, 2870 (three burials), 3705 (25 burials), 3706 (one burial), 3707 (two burials), 3745 (one burial), 2986, 4127 (burials), 4224 (burials), 4225, 4226, 4570, 9500 (six burials), 9901 (burials), 9980 (artifacts)
Davis, 1991	Monitoring	Ft. DeRussy	50-80-14-4570 (prehistoric and historic midden deposits)
Denham and Pantaleo, 1997a	Monitoring	Ft. DeRussy (TMK 2-6-005:001)	50-80-14-4570 (four burials); 50-80-14-4574 (Loko Pāweo I); 50-80-14-4966 (five burials)
Denham and Pantaleo, 1997b	Data Recovery	Ft. DeRussy (TMK 2-6-005:001)	50-80-14-4570 (four burials); 4574 (Loko Pāweo I); 4575 (Loko Ka'ihikapu); 4576 (Loko Pāweo II); 4579 (one burial); 4970 ('auwai)
Elmore and Kennedy, 2002	Monitoring	Ft. DeRussy (TMK 2-6-005:001)	None
Esh and Hammatt, 2004b	Monitoring	Kūhiō Avenue (TMK 1-2-006:015-022)	None
Esh and Hammatt, 2004c	Monitoring	Kūhiō Avenue (TMK 1-2-006:023-028)	None

Author	Nature of Study	Location (TMK 1-)	Sites
Esh and Hammatt, 2006	Monitoring	Waikīkī (TMK 2-6-014, 2-6-015, 2-6-016, 2-6-017, 2-6-020, 2-6-021, 2-6-024, 2-6-25, 2-6-028, 2-6-029)	None
Hammatt and Chiogioji, 1993	Assessment	Waikīkī	None
Hammatt and Chiogioji, 1998c	Assessment	Kalākaua Plaza Phase II (TMK 2-6-018:010, 2-6-018:036, 2-6-018:042, 2-6-018:052, 2-6-018:055, 2-6-018:062, 2-6-018:063, 2-6-018:064, 2-6-018:073, 2-6-018:074)	50-80-14-4970 ('auwai)
Hammatt and McDermott, 1999	Burial	Anti-Crime Lighting, Phase III (TMK 2-6-007, 2-6-013)	50-80-14-5744 (two burials)
Hammatt and Shideler, 1995	Inventory Survey	Convention Center (TMK 2-3-035:001	Charcoal in sediments, but no sites found
Hammatt and Shideler, 1996	Data Recovery	Convention Center (TMK 2-3-035:001	No new sites
Havel and Spear, 2004	Monitoring	ABC Store (TMK 2-6-021:101)	None
Jones and Hammatt, 2004	Monitoring	Anti-Crime Lighting, Phase III (TMK 2-6-007, 2-6-013)	None
Le Suer, et al. , 2000	Inventory Survey	Kalākaua Plaza Phase II (TMK 2-6-018:010, 2-6-018:036, 2-6-018:042, 2-6-018:052, 2-6-018:055, 2-6-018:062, 2-6-018:063, 2-6-018:064, 2-6-018:073, 2-6-018:074)	50-80-14-4970 ('auwai); 50-80-14-5796 (fishpond)
Mann and Hammatt, 2002b	Monitoring	Uluniu Avenue (TMK 2-6-023:)	50-80-14-6369 (one burial); 50-80-14-5859 (two burials); 50-80-14-6372); historic trash pit); 50-80-14-6398 (historic trash pit)
McDermott, et al., 1996	Inventory Survey	Waikīkī (2-6-024:034, 2-6-024:035, 2-6-024:036, 2-6-024:037, 2-6-024:038, 2-6-024:039, 2-6-024:040, 2-6-024:042, 2-6-024:043, 2-6-024:044, 2-6-024:045, 2-6-024:065, 2-6-024:066, 2-6-024:067, 2-6-024:068, 2-6-024:080, 2-6-024:081, 2-6-024:083)	50-80-14-5459 ('auwai/lo'i), 50-80-14-5460 (one burial)
Neller, 1984	Burial	Waikīkī (2-6-027:048, -2-6-028:048)	50-80-14-4127 (seven burials)
O'Leary and Hammatt, 2004	Monitoring	Kapi'olani Avenue (TMK 2-3-003)	None
O'Leary, et al., 2005	Inventory Survey	Waikīkī (2-6-022:009)	50-80-14-6819 (one burial)

Author	Nature of Study	Location (TMK 1-)	Sites
Perzinski, et al., 1999	Monitoring	Anti-Crime Lighting, Phase I (TMK 2-6-)	50-80-15-5744 (two burials)
Perzinski, et al., 2000b	Burial Report	Waikīkī (TMK 2-6-001, 2-6-022, 2-6-023, 2-6-026, 2-6-027, 3-1-043)	50-80-15-5744 (two burials)
Rasmussen, 2005	Monitoring	Ft. DeRussy (TMK 2-6-005:001)	None
Roberts and Bower, 2001	Monitoring	Ft. DeRussy (TMK 2-6-005:001)	None
Simons, et al., 1995	Data Recovery	Ft. DeRussy (TMK 2-6-005:001)	50-80-14-4574 (Loko Pāweo I); 50-80-14-4575 (Loko Ka'ihikapu); 50-80-14-4576 (Loko Pāweo II); 50-80-14-4590; 50-80-14-4570 (four burials); 50-80-14-4579 (one burial)
Tome and Dega, 2003	Monitoring	Waikīkī	None
Tulchin, and Hammatt, 2004	Data Recovery	Waikīkī (TMK 2-6-016:002, 2-6-016:004, 2-6-016:006, 2-6-016:007, 2-6-016:008, 2-6-016:012 to :019, 2-6-016:062, 2-6-016:064, 2-6-016:070, 2-6-016:075, 2-6-016: 076, 2-6-016:077)	50-80-14-6407 (embankment)
Winieski and Hammatt, 2001a	Monitoring	Waikīkī (TMK 2-6-001, 2-6-022, 2-6-023, 2-6-026, 2-6-027, 3-1-043)	50-80-14-5856; 50-80-14-5857; 50-80-14-5858; 50-80-14-5859; 50-80-14-5860; 50-80-14-5861; 50-80-14-5862; 50-80-14-5940; 50-80-14-5941; 50-80-14-5942; 50-80-14-5943
Winieski, et al., 2002a	Monitoring	Waikīkī	None

Section V – Sundry Sites

Within Section V there are three sundry sites. The sundry site at the corner of Alapa'i and King Streets is rated low for potential impact to burials and prehistoric archaeological deposits, but medium for potential impact to historic archaeological resources. The sundry site at the corner of Kalākaua Avenue and Kapi'olani Boulevard is rated medium for potential impacts to all three archaeological impact categories. The sundry site at the corner of Date Street and University Avenue is rated low for potential impacts to all three archaeological impact categories.

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In both Hawaii state and federal historic preservation legislation, mitigation is something that is done to alleviate a project's effect on significant cultural resources. Mitigation can only be done following: 1) the project's cultural resource identification effort, 2) the significance assessment of project's cultural resources, and, 3) the determination of the project's effect on significant cultural resources. Only after these steps in the historic preservation review process have been completed can appropriate mitigation measures be developed and implemented.

Based on the content of this archaeological technical report, it is clear that the Honolulu High-Capacity Transit Corridor project will require a substantial cultural resource identification effort. This will be when additional background research, intensive surface survey, extensive and intensive subsurface testing utilizing many different methods (backhoe trenching, coring, shovel tests, controlled test excavations, potentially limited controlled areal excavation, and remote sensing) will take place within the Locally Preferred Alternative. As discussed in Chapter 2 of this report, the first step of the cultural resource identification effort will be the preparation of an "Archaeological Inventory Survey Plan"--based on Hawaii state historic preservation requirements:

"For the subsequent draft EIS, which will be focused on the Locally Preferred Alternative that will be the project's area of potential effect, a detailed archaeological inventory survey plan will be generated as the first step in the project's formal historic preservation compliance effort. Because there is a good deal of uncertainty regarding the Locally Preferred Alternative, postponing the formal commencement of historic preservation compliance to the draft EIS stage allows for more flexibility and a more appropriate effort allocation to the required archaeological resource identification effort. Because of the probable diversity, distribution, and number of archaeological resources within the Locally Preferred Alternative, an archaeological inventory survey plan will serve to effectively coordinate the effort. The plan will include detailed procedures for the identification, documentation, significance evaluation, and assessment of project effect for the archaeological resources within the Locally Preferred Alternative (per the requirements of HAR Chapter 13-275 and 13-276). The inclusion of the archaeological inventory survey plan in the draft EIS will ensure appropriate agency and public review of the proposed archaeological resource identification effort." [this document, page 2-3]

Once this plan is approved, the extensive and intensive cultural resource identification effort will begin.

Until this cultural resource identification effort of the Locally Preferred Alternative is complete, it is somewhat premature to discuss specific mitigation for project impacts. The following general discussion can serve as a basis for further development of the project's archaeological and cultural resource mitigation program. As the project develops, a comprehensive cultural resource management and mitigation plan will be

developed among all stake-holding parties. The archaeological mitigation plan will be a component of the overall project's cultural resource management plan.

Potential impacts and mitigation are directly related, particularly for the project's direct construction impacts on archaeological resources. Accordingly, Table 5-1's summary of archaeological impacts, with high, medium, and low ratings for the various alignments, can also serve as a guide for the likely mitigation needs for each of the alignments.

Archaeological mitigation will likely take the form of burial treatment, archaeological data recovery, and archaeological monitoring. If there is some flexibility in the construction design, it is possible that preservation of archaeological resources in place might be another form of mitigation.

As there is a reasonable potential for Alternatives 3 and 4 to affect burials, particularly Native Hawaiian burials, the project's program for the treatment of burials should be proactive and conscientious. As a unique class of archaeological resource, burial treatment must be carried out per the specific guidelines of Hawai'i state and federal burial law. Should federal lands be involved, NAGPRA guidelines would need to be followed. As most, if not all, of the proposed project would be on private or state lands, the guidelines of Hawai'i state burial law (HRS Chapter 6E-43 and HAR Chapter 13-300) should be followed. Early consultation with the O'ahu Island Burial Council (OIBC) is appropriate. In consultation with the project's proponents, the OIBC, and the State Historic Preservation Division (SHPD), a project burial treatment plan should be developed. This plan should outline the treatment for all previously identified and inadvertent burial finds encountered by the project.

Archaeological data recovery is the method of extracting important archaeological information from archaeological sites to alleviate the effect of the site's destruction by a project. Data recovery research questions and methods are particular to the types of archaeological resources being mitigated. Typically, a detailed data recovery plan is written and approved by SHPD that describes the data recovery investigation's research questions, data requirements, and the methods for acquiring the needed information to answer the research questions. Once the archaeological investigation is complete, a data recovery report is written that documents all results.

Archaeological monitoring is done to mitigate (and hopefully negate) the impact of a development on as yet unidentified or incompletely documented archaeological resources. The goal is to document exposed archaeological resources and, for the most important archaeological resources, potentially save them from destruction. Archaeological monitoring can be used as a form of archaeological resource identification or mitigation, or as a post-mitigation contingency measure to collect additional information or protect extent archaeological resources. Although archaeological monitoring can be research-driven, often salvage is the driving force. Typically, archaeological monitoring programs follow an archaeological monitoring plan that outlines the construction methods and impacts of the proposed project, the types of archaeological resources that are expected, and the archaeological methods to be used to

document the archaeological resources encountered. A monitoring report is prepared with all results.

Archaeological preservation is the avoidance of archaeological resources and their protection and safeguarding in place. Archaeological preservation can include active interpretation of the archaeological resource, for example with signage and other forms of public interpretation. More basically, it can entail the conservation of the resource through evasion. Preservation strategies and methods differ depending on the type of archaeological resource encountered. Typically, a preservation plan is written describing the archaeological resource and the preservation measures to be enacted. Once approved by SHPD, the plan is implemented.

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